EXHIBIT E

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES AND REQUIREMENTS

Exhibit E - Quality Assurance/Quality Control Procedures and Requirements

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1.0 OVERVIEW

1.1 Quality assurance and quality control are integral parts of the Environmental Protection Agency's (EPA) Contract Laboratory Program (CLP). The quality assurance (QA) process consists of management review and oversight at the planning, implementation, and completion stages of the environmental data collection activity, and ensures that data provided are of the quality required. The quality control (QC) process includes those activities required during data collection to produce the data quality desired and to document the quality of the collected data.

1.2 During the planning of an environmental data collection program, QA activities focus on defining data quality criteria and designing a QC system to measure the quality of data being generated. During the implementation of the data collection effort, QA activities ensure that the QC system is functioning effectively, and that the deficiencies uncovered by the QC system are corrected. After environmental data are collected, QA activities focus on assessing the quality of data obtained to determine its suitability to support enforcement or remedial decisions.

1.3 This exhibit describes the overall quality assurance/quality control operations and the processes by which the CLP meets the QA/QC objectives defined above. This contract requires a variety of QA/QC activities. These contract requirements are the minimum QC operations necessary to satisfy the analytical requirements associated with the determination of the different method analytes. These QC operations are designed to facilitate laboratory comparison by providing EPA with comparable data from all Contractors. These requirements do not release the analytical Contractor from maintaining their own QC checks on method and instrument performance.

2.0 INTRODUCTION

2.1 Appropriate use of data generated under the large range of analytical conditions encountered in environmental analyses requires reliance on the QC procedures and criteria incorporated into the methods. The methods in this contract have been validated on samples typical of those received by the laboratories in the CLP. However, the validation of these methods does not guarantee that they perform equally well for all sample matrices encountered. Inaccuracies can also result from causes other than unanticipated matrix effects, such as sampling artifacts, equipment malfunctions, and operator error. Therefore, the quality control component of each method is indispensable.

2.2 The data acquired from QC procedures are used to estimate and evaluate the information content of analytical results and to determine the necessity for or the effect of corrective action procedures. The parameters used to estimate information content include precision, accuracy, detection limit, and other quantitative and qualitative indicators. In addition, QC procedures give an overview of the activities required in an integrated program to generate data of known and documented quality required to meet defined objectives.

2.3 The necessary components of a complete QA/QC program include internal QC criteria that demonstrate acceptable levels of performance, as determined by QA review. External review of data and procedures is accomplished by the monitoring activities of the National Program
| Office, Regional data users, Sample Management Office (SMO), and *the
| *Quality Assurance Technical Support (QATS) Laboratory*. Each external review accomplishes a different purpose. These reviews are described in specific sections of this exhibit. Laboratory evaluation samples, GC/MS
| *and GC/EC* tape audits, and data packages provide an external QA reference for the program. A Contractor on-site evaluation system is also part of the external QA monitoring. A feedback loop provides the results of the various review functions to the Contractors through direct communications with the Technical Project Officers (TPOs) and Administrative Project Officers (APOs).

2.4 This exhibit does not provide specific instructions for constructing QA plans, QC systems, or a QA organization. It is, however, an explanation of the QA/QC requirements of the program. It outlines some minimum standards for QA/QC programs. It also includes specific items that are required in a QA plan and by the QA/QC documentation detailed in this contract. Delivery of this documentation provides the Agency with a complete data package which will stand alone, and limits the need for contact with the Contractor or with an analyst, at a later date, if some aspect of the analysis is questioned.

2.5 In order to assure that the product delivered by the Contractor meets the requirements of the contract, and to improve interlaboratory data comparison, the Agency requires the following from the Contractor:

- Preparation of and adherence to a written quality assurance plan, the elements of which are designated in Section 3,

- Preparation of and adherence to QA/QC standard operating procedures as described in Section 4,

- Adherence to the analytical methods and associated QC requirements specified in the contract,

- Verification of analytical standards and documentation of the purity of neat materials and the purity and accuracy of solutions obtained from private chemical supply houses,

- Submission of all raw data and pertinent documentation for Regional review,

- Participation in the analysis of laboratory evaluation samples, including adherence to corrective action procedures,

- Submission, upon request, of GC/MS *and/or GC/EC* tapes and applicable documentation for tape audits, including a copy of the sample data package,

- Participation in on-site laboratory evaluations, including adherence to corrective action procedures, and

- Submission of all original documentation generated during sample analyses for Agency review.

3.0 QUALITY ASSURANCE PLAN

3.1 Introduction. The Contractor shall establish a quality assurance program with the objective of providing sound analytical chemical measurements. This program shall incorporate the quality control procedures, any necessary corrective action, and all documentation required during data collection as well as the quality assessment measures performed by management to ensure acceptable data production.

3.1.1 As evidence of such a program, the Contractor shall prepare a written quality assurance plan (QAP) which describes the procedures that are implemented to achieve the following:

- Maintain data **integrity**, **validity**, and **usability**,
- Ensure that analytical measurement systems are maintained in an acceptable state of stability and reproducibility,
- Detect problems through data assessment and establish corrective action procedures which keep the analytical process reliable, and
- Document all aspects of the measurement process in order to provide data which are technically sound and legally defensible.

3.1.2 The QAP shall present, in specific terms, the policies, organization, objectives, functional guidelines, and specific QA and QC activities designed to achieve the data quality requirements in this contract. Where applicable, standard operating procedures pertaining to each element shall be included or referenced as part of the QAP. The QAP shall be paginated consecutively in ascending order. The QAP shall be available during on-site laboratory evaluations. Additional information relevant to the preparation of a QAP can be found in Agency and American Society for Testing and Materials publications.

3.2 Required Elements of a Quality Assurance Plan. The required elements of a laboratory's QAP are outlined in this section. This outline should be used as a framework for developing the QAP.

A. Organization and Personnel

1. QA Policy and Objectives

2. QA Management

a. Organization

b. Assignment of QC and QA Responsibilities

c. Reporting Relationships

d. QA Document Control Procedures

e. QA Program Assessment Procedures

3. Personnel

    a. Résumés

    b. Education and Experience

    c. Training Progress

B. Facilities and Equipment

    1. Instrumentation and Backup Alternatives

    2. Maintenance Activities and Schedules

C. Document Control

    1. Contractor Notebook Policy

    2. Sample Tracking/Custody Procedures

    3. Logbook Maintenance and Archiving Procedures

    4. Case File Organization, Preparation, and Review Procedures

    5. Procedures for Preparation, Approval, Review, Revision, and Distribution of Standard Operating Procedures

    6. Process for Revision of Technical or Documentation Procedures

D. Analytical Methodology

    1. Calibration Procedures and Frequency

    2. Sample Preparation/Extraction Procedures

    3. Sample Analysis Procedures

    4. Standards Preparation Procedures

    5. Decision Processes, Procedures, and Responsibility for Initiation of Corrective Action

E. Data Generation

    1. Data Collection Procedures

    2. Data Reduction Procedures

    3. Data Validation Procedures

    4. Data Reporting and Authorization Procedures

F. Quality Control

1. Solvent, Reagent, and Adsorbent Check Analysis

2. Reference Material Analysis

3. Internal Quality Control Checks

4. Corrective Action and Determination of QC Limit Procedures

5. Responsibility Designation

G. Quality Assurance

1. Data Quality Assurance

2. Systems/Internal Audits

3. Performance/External Audits

4. Corrective Action Procedures

5. Quality Assurance Reporting Procedures

6. Responsibility Designation

3.3 Updating and Submitting the Quality Assurance Plan

3.3.1 Initial Submission. During the contract solicitation process, the Contractor is required to submit their QAP to the *Contracting* Officer. Within 60 days after contract award, the Contractor shall revise the QAP to be in full compliance with the requirements of this contract. The Contractor shall maintain the QAP on file at the Contractor's facility for the term of the contract. The revised QAP will become the official QAP under the contract and may be used during legal proceedings. Both the initial QAP submission and the revised QAP shall be paginated consecutively in ascending order. The revised QAP shall include:

- Changes resulting from (1) the Contractor's internal review of their organization, personnel, facility, equipment, policy, and procedures and (2) the Contractor's implementation of the requirements of the contract, and

- Changes resulting from the Agency's review of the laboratory evaluation sample data, bidder-supplied documentation, and recommendations made during the pre-award on-site laboratory evaluation.

3.3.1.1 The Contractor shall send a copy of the *latest version of the* QAP within 7 days of a request from a Technical Project Officer or Administrative Project Officer. The Agency requestor will designate the recipients.

3.3.2 Subsequent Updates and Submissions. During the term of the contract, the Contractor shall amend the QAP when the following circumstances occur:

- The Agency modifies the contract,
- The Agency notifies the Contractor of deficiencies in the QAP,
- The Agency notifies the Contractor of deficiencies resulting from the Agency's review of the Contractor's performance,
- The Contractor identifies deficiencies resulting from the internal review of the QAP,
- The Contractor's organization, personnel, facility, equipment, policy, or procedures change, or
- The Contractor identifies deficiencies resulting from the internal review of changes in their organization, personnel, facility, equipment, policy, or procedures.

3.3.2.1 The Contractor shall amend the QAP within 30 days of when the circumstances listed above result in a discrepancy between what was previously described in the QAP and what is presently occurring at the Contractor's facility. When the QAP is amended, all changes in the QAP shall be clearly marked (e.g., a bar in the margin indicating where the change is found in the document, or highlighting the change by underlining the change, bold printing the change, or using a different print font). The amended pages shall have the date on which the changes were implemented. The | Contractor shall incorporate all amendments to the *latest version* | *of the* QAP. The Contractor shall archive all amendments to the QAP for future reference by the Agency.

| 3.3.2.2 The Contractor shall send a copy of the *latest version of the* QAP within 7 days of a request from a Technical Project Officer or Administrative Project Officer. The Agency requestor will designate the recipients.

3.4 Corrective Actions. If the Contractor fails to adhere to the requirements listed in Section 3, the Contractor may expect, but the Agency is not limited to, the following actions: reduction of numbers of samples sent under this contract, suspension of sample shipment to | the Contractor, a GC/MS *and/or GC/EC* tape audit, a data package audit, an on-site laboratory evaluation, a remedial laboratory evaluation sample, and/or contract sanctions.

4.0 STANDARD OPERATING PROCEDURES

4.1 Introduction. In order to obtain reliable results, adherence to prescribed analytical methodology is imperative. In any operation that is performed on a repetitive basis, reproducibility is best accomplished through the use of standard operating procedures (SOPs). As defined by EPA, an SOP is a written document which provides directions for the step-by-step execution of an operation, analysis, or action which is commonly accepted as the method for performing certain routine or repetitive tasks.

4.1.1 SOPs prepared by the Contractor shall be functional (i.e., clear, comprehensive, up-to-date, and sufficiently detailed to permit duplication of results by qualified analysts). The SOPs shall be paginated consecutively in ascending order.

4.1.2 All SOPs shall reflect activities as they are currently performed by the Contractor. In addition, all SOPs shall be:

- Consistent with current Agency regulations, guidelines, and the CLP contract's requirements.
- Consistent with instrument manufacturers' specific instruction manuals.
- Available to the Agency during an on-site laboratory evaluation. A complete set of SOPs shall be bound together and available for inspection at such evaluations. During on-site evaluations, Contractor personnel may be asked to demonstrate the application of the SOPs.
- Available to the designated recipients within 7 days, upon request by the Technical Project Officer or Administrative Project Officer.
- Capable of providing for the development of documentation that is sufficiently complete to record the performance of all tasks required by the protocol.
- Capable of demonstrating the validity of data reported by the Contractor and explaining the cause of missing or inconsistent results.
- Capable of describing the corrective measures and feedback mechanism utilized when analytical results do not meet protocol requirements.
- Reviewed regularly and updated as necessary when contract, facility, or Contractor procedural modifications are made.
- Archived for future reference in usability or evidentiary situations.
- Available at specific work stations as appropriate.

- Subject to a document control procedure which precludes the use of outdated or inappropriate SOPs.

4.2 Format. The format for SOPs may vary depending upon the kind of activity for which they are prepared; however, at a minimum, the following sections shall be included:

- Title page,
- Scope and application,
- Definitions,
- Procedures,
- QC limits,
- Corrective action procedures, including procedures for secondary review of information being generated,
- Documentation description and example forms,
- Miscellaneous notes and precautions, and
- References.

4.3 Requirements. The Contractor shall maintain the following SOPs.

4.3.1 Evidentiary SOPs for required chain-of-custody and document control are discussed in Exhibit F.

4.3.2 Sample Receipt and Storage

- Sample receipt and identification logbooks
- Refrigerator temperature logbooks
- Extract storage logbooks
- Security precautions

4.3.3 Sample Preparation

- Reagent purity check procedures and documentation
- Extraction procedures
- Extraction bench sheets
- Extraction logbook maintenance

4.3.4 Glassware Cleaning

4.3.5 Calibration (Balances)

- Procedures
- Frequency requirements
- Preventative maintenance schedule and procedures
- Acceptance criteria and corrective actions
- Logbook maintenance

4.3.6 Analytical Procedures (for each Analytical System, including GPC)

- Instrument performance specifications
- Instrumental operating procedures
- Data acquisition system operation
- Procedures when automatic quantitation algorithms are overridden
- QC required parameters
- Analytical run/injection logbooks
- Instrumental error and editing flag descriptions and resulting corrective actions

4.3.7 Maintenance Activities (for each Analytical System, including GPC)

- Preventative maintenance schedule and procedures
- Corrective maintenance determinants and procedures
- Maintenance authorization

4.3.8 Analytical Standards

- Standard coding/identification and inventory system
- Standards preparation logbook(s)
- Standards preparation procedures
- Procedures for equivalency/traceability analyses and documentation
- Purity logbook (primary standards and solvents)
- Storage, replacement, and labeling requirements
- QC and corrective action measures

4.3.9 Data Reduction Procedures

- Data processing systems operation
- Outlier identification methods
- Identification of data requiring corrective action
- Procedures for format and/or forms for each operation

4.3.10 Documentation Policy/Procedures

- Contractor/analysts' notebook policy, including review policy
- Complete SDG File contents
- Complete SDG File organization and assembly procedures, including review policy
- Document inventory procedures, including review policy

4.3.11 Data Validation/Self-Inspection Procedures

- Data flow and chain-of-command for data review
- Procedures for measuring precision and accuracy
- Evaluation parameters for identifying systematic errors
- Procedures to ensure that hardcopy and *electronic deliverables (e.g., diskette, telefacsimile)* are complete and compliant with the requirements in Exhibits B and H
- Procedures to ensure that hardcopy deliverables are in agreement with their comparable *electronic* deliverables
- Demonstration of internal QA inspection procedure (demonstrated by supervisory sign-off on personal notebooks, internal performance evaluation samples, etc.)
- Frequency and type of internal audits (e.g., random, quarterly, spot checks, perceived trouble areas)
- Demonstration of problem identification, corrective actions and resumption of analytical processing; sequence resulting from internal audit (i.e., QA feedback)
- Documentation of audit reports (internal and external), audit response, corrective action, etc.

4.3.12 Data Management and Handling

- Procedures for controlling and estimating data entry errors
- Procedures for reviewing changes to data and deliverables and ensuring traceability of updates
- Life cycle management procedures for testing, modifying and implementing changes to existing computing systems including hardware, software, and documentation or installing new systems
- Database security, backup and archival procedures including recovery from system failures
- System maintenance procedures and response time
- Individuals(s) responsible for system operation, maintenance, data integrity and security
- Specifications for staff training procedures
- Storage, retrieval, and verification of the completeness and readability of GC/MS *and GC/EC* files transferred to magnetic media

4.4 Submitting and Updating SOPs

4.4.1 Initial Submission. During the contract solicitation process, the Contractor is required to submit their SOPs to the *Contracting* Officer. Within 60 days after contract award, the Contractor shall prepare and maintain on file, at their facility, a complete, revised set of SOPs fully compliant with the requirements of this contract. The revised SOPs will become the official SOPs under the contract and may be used during legal proceedings. Both the initial submission of SOPs and the revised SOPs shall be paginated consecutively in ascending order. The revised SOPs shall include:

- Changes resulting from (1) the Contractor's internal review of their procedures and (2) the Contractor's implementation of the requirements of the contract, and
- Changes resulting from the Agency's review of the laboratory evaluation sample data, bidder-supplied documentation, and recommendations made during the pre-award on-site laboratory evaluation.

4.4.1.1 The Contractor shall send a complete set of *the latest version of* SOPs or individually requested SOPs within 7 days of a request from a Technical Project Officer or Administrative Project Officer. The Agency requestor will designate the recipients.

4.4.2 Subsequent Updates and Submissions. During the term of the contract, the Contractor shall amend the SOPs when the following circumstances occur:

- The Agency modifies the contract,
- The Agency notifies the Contractor of deficiencies in their SOPs,
- The Agency notifies the Contractor of deficiencies resulting from the Agency's review of the Contractor's performance,
- The Contractor's procedures change,
- The Contractor identifies deficiencies resulting from the internal review of their SOPs documentation, or
- The Contractor identifies deficiencies resulting from the internal review of their procedures.

4.4.2.1 Existing SOPs shall be amended or new SOPs shall be written within 30 days of when the circumstances listed above result in a discrepancy between what was previously described in the SOPs and what is presently occurring at the Contractor's facility. All changes in the SOPs shall be clearly marked (e.g., a bar in the margin indicating where the change is in the document, or highlighting the change by underlining the change, bold printing the change, or using a different print font). The amended/new SOPs shall have the date on which the changes were implemented.

4.4.2.2 When existing SOPs are amended or new SOPs are written, the Contractor shall document the reason(s) for the change, and maintain the amended or new SOPs on file at the laboratory facility. Documentation of the reason(s) for the changes shall be maintained on file with the amended SOPs or new SOPs.

| 4.4.2.3 The Contractor shall send a complete set of *the latest version of* SOPs or individually requested SOPs within 7 days of a request from a Technical Project Officer or Administrative Project Officer. The Agency requestor will designate the recipients.

4.4.2.4 Documentation of the reason(s) for changes to the SOPs shall also be submitted with the SOPs. An alternate delivery schedule for submitting the amended/new SOPs and their documentation may be proposed by the Contractor, but it is the sole decision of the Agency, represented either by the Technical Project Officer or Administrative Project Officer, to approve or disapprove the alternate delivery schedule. If an alternate delivery schedule is proposed, the Contractor shall describe in a letter to the Technical Project Officer, Administrative Project Officer, and the Contracting Officer why he/she is unable to meet the delivery schedule listed in this section. The Technical Project Officer/Administrative Project Officer will not grant an extension for greater than 30 days for amending/writing new SOPs. The Technical Project Officer/Administrative Project Officer will not grant an extension for greater than 14 days for submission of the letter documenting the reasons for the changes and for submitting amended/new SOPs. The Contractor shall proceed and not assume

that an extension will be granted until so notified by the Technical Project Officer and/or Administrative Project Officer.

4.5 Corrective Actions. If the Contractor fails to adhere to the requirements listed in Section 4, the Contractor may expect, but the Agency is not limited to, the following action: reduction of number of samples sent under this contract, suspension of sample shipment to the Contractor, a GC/MS *and/or GC/EC* tape audit, a data package audit, an on-site laboratory evaluation, a remedial laboratory evaluation sample, and/or contract sanctions.

5.0 ANALYTICAL STANDARDS REQUIREMENTS

5.1 Overview. EPA will not supply analytical reference standards either for direct analytical measurements or for the purpose of traceability. All Contractors shall be required to prepare from neat materials or purchase from private chemical supply houses those standards necessary to successfully and accurately perform the analyses required in this protocol.

5.2 Preparation of Chemical Standards from the Neat High Purity Bulk Material. A Contractor may prepare their chemical standards from neat materials. Contractors shall obtain the highest purity possible when purchasing neat chemical standards; when standards are purchased at less than 97% purity, the Contractor shall document the reason why a higher purity could not be obtained.

5.2.1 Neat chemical standards shall be kept refrigerated when not being used in the preparation of standard solutions. Proper storage of neat chemicals is essential in order to safeguard them from decomposition.

5.2.2 The purity of a compound can sometimes be misrepresented by a chemical supply house. Since knowledge of purity is needed to calculate the concentration of solute in a solution standard, it is the Contractor's responsibility to have analytical documentation ascertaining that the purity of each compound is correctly stated. Purity confirmation, when performed, should use either differential scanning calorimetry, gas chromatography with flame ionization detection, high performance liquid chromatography, infrared spectrometry, or other appropriate techniques. Use of two or more independent methods is recommended. The correction factor for impurity when weighing neat materials in the preparation of solution standards is:

EQ. 1

$$\textit{weight of impure compound} = \frac{\textit{weight of pure compound}}{(\textit{percent purity}/100)}$$

where "weight of pure compound" is that required to prepare a specific volume of a standard solution at a specified concentration.

5.2.3 When compound purity is assayed to be 97% or greater, the weight may be used without correction to calculate the concentration of the stock standard. If the compound purity is assayed to be less than 97%, the weight shall be corrected when calculating the concentration of the stock solution.

5.2.4 Mis-identification of compounds occasionally occurs and it is possible that a mislabeled compound may be received from a chemical supply house. It is the Contractor's responsibility to have analytical documentation ascertaining that all compounds used in the preparation of solution standards are correctly identified.

Identification confirmation, when performed, shall use gas chromatography/mass spectrometry analysis on at least two different analytical columns, or other appropriate techniques.

5.2.5 Calculate the weight of material to be weighed out for a specified volume taking into account the purity of the compound and the desired concentration. A second person shall verify the accuracy of the calculations. Check balances for accuracy with a set of standard weights every 12 hours. All weighing shall be performed on an analytical balance to the nearest 0.1 mg and verified by a second person. The solvent used to dissolve the solute shall be compatible with the protocol in which the standard is to be used; the solute shall be soluble, stable, and nonreactive with the solvent. In the case of a multicomponent solution, the components must not react with each other.

5.2.6 Transfer the solute to a volumetric flask and dilute to the specified solution volume with solvent after ensuring dissolution of the solute in the solvent. Sonication or warming may be performed to promote dissolution of the solute. This solution shall be called the primary standard and all subsequent dilutions shall be traceable back to the primary standard.

5.2.7 Log notebooks shall be kept for all weighing and dilutions. All subsequent dilutions from the primary standard and the calculations for determining their concentrations shall be recorded and verified by a second person. All solution standards shall be refrigerated when not in use. All solution standards shall be clearly labeled as to the identity of the compound or compounds, concentration, date prepared, solvent, and initials of the preparer.

5.3 Purchase of Chemical Standards Already in Solution. Solutions of analytical reference standards can be purchased by Contractors provided they meet the following criteria.

5.3.1 Contractors shall maintain the following documentation to verify the integrity of the standard solutions they purchase:

- Mass spectral identification confirmation of the solution,
- Purity confirmation of the solution, and
- Chromatographic and quantitative documentation that the solution standard was QC checked according to the following section.

5.3.2 The Contractor shall purchase standards for which the quality is demonstrated statistically and analytically. One way this may be demonstrated is to prepare and analyze three solutions, a high standard, a low standard, and a standard at the target concentration (see Sections 5.3.2.1 and 5.3.2.2). The Contractor shall have documentation to demonstrate that the analytical results for the high standard and low standard are consistent with the difference in theoretical concentrations. This is done by the Student's t-test in Section 5.3.2.4. If this is achieved, the Contractor shall then

demonstrate that the concentration of the target standard lies midway between the concentrations of the low and high standards. This is done by the Student's t-test in Section 5.3.2.5. The standard is certified to be within 10% of the target concentration using the equations in Section 5.3.2.6. If this procedure is used, the Contractor shall document that the following have been achieved.

5.3.2.1 Two solutions of identical concentration shall be prepared independently from solutions. An aliquot of the first solution shall be diluted to the intended concentration (the "target standard"). One aliquot is taken from the second solution and diluted to a concentration 10% greater than the target standard. This is called the "high standard." One further aliquot is taken from the second solution and diluted to a concentration 10% less that the target standard. This is called the "low standard."

5.3.2.2 Six replicate analyses of each standard (a total of 18 analyses) shall be performed in the following sequence: low standard, target, high standard, low standard, target standard, high standard, ...

5.3.2.3 The mean and variance of the six results for each solution shall be calculated.

EQ. 2

$$Mean = \frac{\sum_{i=1}^{6} Y_i}{6}$$

EQ. 3

$$Variance = \frac{\sum_{i=0}^{6} Y_i^2 - 6(MEAN)^2}{5}$$

The values Y_i represent the results of the six analyses of each standard. The means of the low, target, and high standards are designated M_1, M_2, and M_3, respectively. The variances of the low, target, and high standards are designated V_1, V_2, and V_3, respectively. Additionally, a pooled variance, V_p, is calculated.

EQ. 4

$$V_p = \frac{\frac{V_1}{0.81} + V_2 + \frac{V_3}{1.21}}{3}$$

If the square root of V_p is less than 1% of M_2, then $M_2^2/10{,}000$ shall be used as the value of V_p in all subsequent calculations.

5.3.2.4 The test statistic shall be calculated.

EQ. 5

$$Test\ Statistic = \frac{\left| \frac{M_3}{1.1} - \frac{M_1}{0.9} \right|}{\sqrt{\frac{V_p}{3}}}$$

If the test statistic exceeds 2.13, then a 20% difference between the high and low standards exists. In such a case, the standards are not acceptable.

5.3.2.5 The test statistic shall be calculated.

EQ. 6

$$Test\ Statistic = \frac{\left| M_2 - \frac{M_1}{1.8} - \frac{M_3}{2.2} \right|}{\sqrt{\frac{V_p}{4}}}$$

If the test statistic exceeds 2.13, then the target standard concentration has not been demonstrated to be the midway between the high and low standards. In such a case, the standards are not acceptable.

5.3.2.6 The 95% confidence intervals for the mean result of each standard shall be calculated.

EQ. 7

$$Interval\ for\ Low\ Standard = M_1 \pm 2.13 \sqrt{\frac{V_p}{6}}$$

EQ. 8

$$Interval\ for\ Target\ Standard = M_2 \pm 2.13 \sqrt{\frac{V_p}{6}}$$

EQ. 9

$$\textit{Interval for High Standard} = M_3 \pm 2.13 \sqrt{\frac{V_p}{6}}$$

5.3.2.6.1 These intervals shall not overlap. If overlap is observed, the ability to discriminate the 10% difference in concentrations has not been demonstrated. In such a case, the standards are not acceptable.

5.3.2.6.2 In any event, the Contractor is responsible for the quality of the standards employed for analyses under this contract.

5.4 Requesting Standards From the EPA Standards Repository. Solutions of analytical reference materials can be ordered from the U.S. EPA Chemical Standards Repository, depending on availability. The Contractor can place an order for standards only after demonstrating that these standards are not available from commercial vendors, either in solution or as a neat material.

5.5 Documentation of the Verification and Preparation of Chemical Standards. It is the responsibility of each Contractor to maintain the necessary documentation to show that the chemical standards they have used in the performance of CLP analysis conform to the requirements previously listed.

5.5.1 Weighing logbooks, calculations, chromatograms, mass spectra, etc., whether produced by the Contractor or purchased from chemical supply houses, shall be maintained by the Contractor and may be subject to review during on-site laboratory evaluations. In those cases where the documentation is supportive of the analytical results of data packages sent to the Agency, such documentation is to be kept on file by the Contractor for a period of one year.

5.5.2 Upon request by the Technical Project Officer or Administrative Project Officer, the Contractor shall submit their most recent previous year's documentation (12 months) for the verification and preparation of chemical standards within 14 days of the receipt of request to the recipients he/she designates.

5.5.3 The Agency may generate a report discussing deficiencies in the Contractor's documentation for the verification and preparation of chemical standards or may discuss the deficiencies during an on-site laboratory evaluation. In a detailed letter to the Technical Project Officer and the Administrative Project Officer, the Contractor shall address the deficiencies and the subsequent corrective action implemented by the Contractor to correct the deficiencies within 14 days of receipt of the report or the on-site laboratory evaluation. An alternate delivery schedule may be proposed by the Contractor, but it is the sole decision of the Agency, represented either by the Technical Project Officer or Administrative Project Officer, to approve or disapprove the alternate delivery schedule. If an

alternate delivery schedule is proposed, the Contractor shall describe in a letter to the Technical Project Officer, Administrative Project Officer, and the Contracting Officer why he/she is unable to meet the delivery schedule listed in this section. The Technical Project Officer/Administrative Project Officer will not grant an extension for greater than 14 days for the Contractor's response letter to the standards documentation report. The Contractor shall proceed and not assume that an extension will be granted until so notified by the Technical Project Officer and/or Administrative Project Officer.

5.5.4 If new SOPs are required to be written or SOPs are required to be amended because of deficiencies and the subsequent corrective action implemented by the Contractor, the Contractor shall write/amend and submit the SOPs per the requirements listed in Section 4.

5.6 Corrective Actions. If the Contractor fails to adhere to the requirements listed in Section 5, the Contractor may expect, but the Agency is not limited to, the following actions: reduction of number of samples sent under the contract, suspension of sample shipment to Contractor, a GC/MS *and/or GC/EC* tape audit, a data package audit, an on-site laboratory evaluation, a remedial laboratory evaluation sample, and/or contract sanctions.

6.0 DETERMINATION OF METHOD EQUIVALENCY FOR ALTERNATIVE EXTRACTION PROCEDURES

If the Contractor wishes to use one or both of the alternative extraction procedures described in Section 1.3 Exhibits D SVOA and D PEST under Scope and Application, the Contractor must develop and implement SOPs for performing the alternative extractions in accordance to Exhibit E Section 4.0. In addition, the Contractor shall maintain documentation, including raw data, to demonstrate the equivalence of the alternative extraction procedures to those specified in Sections 10.1.4.4, Exhibit D SVOA and 10.1.5.3, Exhibit D PEST. The required documentation for demonstrating extraction equivalence include an Initial Precision Recovery study as described below.

6.1 Initial Precision Recovery (IPR) Study

6.1.1 For the semivolatile fraction, the Contractor shall spike four (4) solid samples (e.g., anhydrous sodium sulfate) with all the target compounds at concentrations equal to three (3) times the Contract Required Quantitation Limits (CRQL) listed in Exhibit C under semivolatiles. For pesticides/Aroclors, the Contractor shall spike four (4) solid samples with the single component target compounds and an additional four (4) solid samples with Aroclor 1254 only at concentrations equal to three (3) times the CRQLs listed in Exhibit C under pesticides/Aroclors. Each sample must contain the appropriate surrogates at the concentrations specified in Section 10.1.4.4, Exhibit D SVOA or Section 10.1.5.3.3, Exhibit D PEST.

6.1.2 The Contractor shall achieve the following recovery limits for the matrix spike compounds in each of the four replicates of the IPR study.

Recovery Limits for Matrix Spike Compounds

Semivolatiles

Compound	Recovery Limits
Phenol	26-90
2-Chlorophenol	25-102
N-Nitroso-di-n-propylamine	41-126
4-Chloro-3-methylphenol	26-103
Acenaphthene	31-137
4-Nitrophenol	11-114
2,4-Dinitrotoluene	28-89
Pentachlorophenol	17-109
Pyrene	35-142

Pesticides	
Compound	Recovery Limits
Gamma-BHC (Lindane)	46-127
Heptachlor	35-130
Aldrin	34-132
Dieldrin	31-134
Endrin	42-139
4,4'-DDT	23-134

6.1.3 The advisory limits for the mean percent recoveries (%R) of all other target compounds in the IPR study is 75% to 125% of the spiked amount.

6.1.4 The advisory limits for the % Relative Standard Deviation (%RSD) of the IPR recoveries for each compound is 25% and shall not exceed 50%.

6.2 Analytical Protocol Required

6.2.1 The Contractor shall extract all IPR samples using SW-846 Methods 3541 (Revision 0, September 1994) and 3545 (Revision 0, December 1996) modified where appropriate to achieve the requirements of this SOW (i.e., CRQLs and all technical acceptance criteria). All modifications to the extraction procedure (e.g., use of methylene chloride/acetone (1:1, v/v) for pesticide extraction) shall be adequately documented and submitted with the data package.

6.2.2 The Contractor shall follow the sample cleanup procedures described in Exhibit D SVOA for semivolatiles and Exhibit D PEST for pesticides/Aroclors.

6.2.3 The Contractor shall analyze the sample extracts for the IPR study following the procedures described in Section 10.6, Exhibit D SVOA for semivolatile compounds and Section 10.2, Exhibit D PEST for pesticides/Aroclors compounds.

6.3 Quantitation Limits/Quality Control Requirements

6.3.1 The Contractor shall achieve the CRQLs specified in Exhibit C under semivolatiles and pesticides/Aroclors.

6.3.2 The Contractor shall follow all QC requirements outlined in Exhibit D SVOA and Exhibit D PEST including frequency of method blanks, instrument blanks, instrument performance checks, initial and continuing calibrations or calibration verifications, internal standards, and surrogates.

6.3.3 All technical acceptance criteria for sample analysis, method blank, and instrument blank analyses described in Exhibit D SVOA and Exhibit D PEST shall be met.

6.3.4 All semivolatile surrogate recoveries shall be within the limits specified in Table 7, Exhibit D SVOA.

6.3.5 The advisory limits for the recovery of pesticide surrogates are 30% to 150%.

6.4 Data Deliverable Requirements

6.4.1 The Contractor shall submit data packages containing all documentation formatted as required in Exhibits B and H (including, but not limited to, SDG Narrative, appropriate summary forms, and raw data). Each IPR replicate shall be reported as a separate sample (i.e., field sample) on Form I. All tuning data, initial calibration data, continuing calibration data, and associated blanks with their raw data must be included in the data package. The Contractor shall include the source of the blank solid samples used for the IPR study in the data deliverables.

6.4.2 The Contractor shall include in the SDG Narrative a discussion of any modifications to the extraction procedures and any problems encountered along with the resolutions. The Contractor shall provide an explanation in the SDG Narrative for any of the target compound recoveries that fall outside the advisory limits. A summary of the IPR results with all calculations must also be included in the SDG Narrative.

6.4.3 Simultaneous delivery of the complete Method Equivalency Data Package shall be made to the following recipients:

EPA: Data Package will be delivered to the laboratory's Administrative Project Officer (APO).

SMO: USEPA Contract Laboratory Program
Sample Management Office (SMO)[1]
2000 Edmund Halley Drive
Reston, VA 20191-3436

QATS: USEPA Contract Laboratory Program
Quality Assurance Technical Support (QATS) Laboratory[2]
2700 Chandler Avenue, Building C
Las Vegas, NV 89120
Attn: Data Audit Staff

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[1]*The Sample Management Office (SMO) is a contractor operated facility operating under the CLASS contract awarded and administered by the EPA.*

[2]*The Quality Assurance Technical Support (QATS) Laboratory is a contractor operated facility operating under the QATS contract awarded and administered by the EPA.*

| *7.0* CONTRACT COMPLIANCE SCREENING

| *7.1* Contract compliance screening (CCS) is one aspect of the Government's contractual right of inspection of analytical data. CCS examines the Contractor's adherence to the contract requirements based on the sample data package delivered to the Agency.

| *7.2* CCS is performed by the Sample Management Office (SMO) under the direction of the Agency. To assure a uniform review, a set of standardized procedures has been developed to evaluate the sample data package submitted by a Contractor against the technical and completeness requirements of the contract. The government reserves the right to add and/or delete individual checks. CCS results are used in conjunction with other information to measure overall Contractor performance and to take appropriate actions to correct deficiencies in performance.

| *7.3* CCS results are mailed to the Contractor and all other data recipients. The Contractor has a period of time to correct deficiencies. The Contractor shall send all corrections to the Regional client and SMO.

| *7.4* The Agency may generate a CCS trend report which summarizes CCS results over a given period of time. The Agency may send the CCS trend report or discuss the CCS trend report during an on-site laboratory evaluation. In a detailed letter to the Technical Project Officer and Administrative Project Officer, the Contractor shall address the deficiencies and the subsequent corrective action implemented by the Contractor to correct the deficiencies within 14 days of receipt of the report or the on-site laboratory evaluation. An alternate delivery schedule may be proposed by the Contractor, but it is the sole decision of the Agency, represented by the Technical Project Officer or Administrative Project Officer, to approve or disapprove the alternate delivery schedule. If an alternate delivery schedule is proposed, the Contractor shall describe in a letter to the Technical Project Officer, Administrative Project Officer, and Contracting Officer why he/she is unable to meet the delivery schedule listed in this section. The Technical Project Officer/Administrative Project Officer will not grant an extension for greater than 14 days for the Contractor's response to the CCS trend report. The Contractor shall proceed and not assume that an extension will be granted until so notified by the Technical Project Officer and/or Administrative Project Officer.

| *7.5* If new SOPs are required to be written or SOPs are required to be amended because of the deficiencies and the subsequent corrective action implemented by the Contractor, the Contractor shall write/amend and submit the SOPs per the requirements listed in Section 4.

| *7.6* If the Contractor fails to adhere to the requirements listed in Section
| *7*, the Contractor may expect, but the Agency is not limited to, the following actions: reduction of number of samples sent under the contract, suspension of sample shipment to the Contractor, a GC/MS
| *and/or GC/EC* tape audit, a data package audit, an on-site laboratory evaluation, a remedial laboratory evaluation sample, and/or contract sanctions.

| *8.0* REGIONAL DATA REVIEW

| *8.1* Contractor data are generated to meet the specific needs of the EPA Regions. In order to verify the usability of data for the intended purpose, each Region reviews data from the perspective of the end user, based upon functional aspects of data quality. General guidelines for data review have been developed jointly by the Regions and the National Program Office. Each Region uses these guidelines as the basis for data evaluation. Individual Regions may augment the basic guideline review process with additional review based on Region-specific or site-specific concerns. Regional reviews, like the sites under investigation, vary based on the nature of the problems under investigation and the Regional response appropriate to the specific circumstances.

| *8.2* Regional data reviews, relating usability of the data to a specific site, are part of the collective assessment process. They complement the review done at the Sample Management Office, which is designed to identify contractual discrepancies, and the review done by the Program Office, which is designed to evaluate Contractor and method performance. These individual evaluations are integrated into a collective review that is necessary for Program and Contractor administration and management and may be used to take appropriate action to correct deficiencies in the Contractor's performance.

9.0 PROFICIENCY TESTING

As a means of measuring and evaluating both the Contractor's and the method's analytical performance, the Contractor must participate in EPA's Proficiency Testing Program. EPA's Proficiency Testing Program involves the analysis of case specific Performance Evaluation (PE) samples and the participation in interlaboratory Quarterly Blind (QB) Audits. The Contractor's analytical PE samples and QB results will be used by EPA to assess and verify the Contractor's continuing ability to produce acceptable analytical data in accordance with the contractual requirements.

9.1 Performance Evaluation Samples

9.1.1 The Performance Evaluation sample(s) may be scheduled with the Contractor as frequently as on an SDG-by-SDG basis. The PE samples may be sent either by the Regional Client or the National Program Office. PE samples will assist EPA in monitoring Contractor performance.

9.1.2 PE samples will be provided as either single-blinds (recognizable as a PE sample but of unknown composition), or as double-blinds (not recognizable as a PE sample and of unknown composition). The Contractor will not be informed of either the analytes or the concentrations in the PE samples.

9.1.3 The Contractor may receive the PE samples as either full volume samples or ampulated/bottled concentrates from EPA or a designated EPA Contractor. The PE samples shall come with instructions concerning the unique preparation procedures, if any, required to reconstitute the PE samples (i.e., the required dilution of the PE sample concentrate). PE samples are to be extracted and/or analyzed with the rest of the routine samples in the SDG. The Contractor shall prepare and analyze the PE sample using the procedure described in the sample preparation and method analysis sections of Exhibit D. All contract required QC shall also be met. The PE sample results are to be submitted in the SDG deliverable package per normal reporting procedures detailed in Exhibit B.

9.1.4 In addition to PE sample preparation and analysis, the Contractor shall be responsible for correctly identifying and quantitating the analytes included in each PE sample. When PE sample results are received by EPA, the PE sample results will be evaluated for correct analytical identification and quantitation. EPA will notify the Contractor of unacceptable performance. EPA reserves the right to adjust the PE sample acceptance windows in order to compensate for any unanticipated difficulties with a particular PE sample.

9.1.5 The Contractor shall demonstrate acceptable analytical performance for both identification and quantitation of PE sample analytes. For unacceptable PE sample performance, EPA may take, but is not limited to the following actions: reduce value or rejection of data for the samples, SDG, or Case impacted; Show Cause and/or Cure Notice; reduction in the number of samples shipped to the laboratory;

suspension of sample shipment; an on-site laboratory inspection; a full data package audit; and/or require the laboratory to analyze a Remedial QB.

9.2 Quarterly Blind Audits

9.2.1 Quarterly Blind (QB) Audits may be scheduled concurrently with all contract laboratories up to a frequency of four times a year. A Quarterly Blind Audit is a unique analytical case containing only Performance Evaluation samples (i.e., referred to as Quarterly Blind (QB) samples). The QB samples will be scheduled by the National Program Office through the CLASS Contractor. QB samples will assist EPA in monitoring Contractor performance.

9.2.2 QB samples will be provided as single-blinds (recognizable as a PE sample but of unknown composition). The Contractor will not be informed of either the analytes or the concentrations in the PE samples.

9.2.3 The Contractor may receive the QB samples as either full volume samples or ampulated/bottled concentrates from EPA or a designated EPA Contractor. The QB samples shall come with instructions concerning the unique preparation procedures, if any, required to reconstitute the QB samples (i.e., the required dilution of the QB sample concentrate). The Contractor shall prepare and analyze the QB samples using the procedure described in the sample preparation and method analysis sections of Exhibit D. All contract required QC shall also be met. The QB sample results are to be submitted in the SDG deliverable package per normal reporting procedures detailed in Exhibit B.

9.2.4 In addition to QB sample preparation and analysis, the Contractor shall be responsible for correctly identifying and quantitating the analytes included in each QB sample. When QB sample results are received by EPA, the QB sample results will be scored for correct analytical identification and quantitation. The QB sample scoring will be provided to the Contractor via coded evaluation sheets, by analyte. EPA will notify the Contractor of unacceptable performance. EPA reserves the right to adjust the PE sample acceptance windows in order to compensate for any unanticipated difficulties with a particular PE sample. The Contractor's QB sample performance will be assessed into one of the following three categories:

*9.2.4.1 **Acceptable, No Response Required**: Score greater than or equal to 90 percent. The data meets most or all of the scoring criteria. No response is required.*

*9.2.4.2 **Acceptable, Response Explaining Deficiencies Required**: Score greater than or equal to 75 percent, but less than 90 percent. Deficiencies exist in the Contractor's performance. Corrective action response required.*

9.2.4.3 ***Unacceptable Performance, Response Explaining Deficiencies Required****: Score less than 75 percent. Deficiencies exist in the Contractor's performance to the extent that the National Program Office has determined that the Contractor has not demonstrated the capability to meet the contract requirements. Corrective action response required.*

9.2.5 In the case of Section 9.2.4.2 or 9.2.4.3, the Contractor shall describe the deficiency(ies) and the action(s) taken to correct the deficiency(ies) in a corrective action letter to the Administrative Project Officer, the Technical Project Officer, and the CLP Quality Assurance Coordinator within 14 days of receipt of notification from the Agency.

9.2.5.1 An alternate delivery schedule for the corrective action letter may be proposed by the Contractor, but it is the sole decision of the Agency, represented either by the Technical Project Officer or Administrative Project Officer, to approve or disapprove the alternate delivery schedule. If an alternate delivery schedule is proposed, the Contractor shall describe in a letter to the Technical Project Officer, Administrative Project Officer, and Contracting Officer why the laboratory is unable to meet the original delivery schedule listed in Section 9.2.5. The Technical Project Officer/Administrative Project Officer will not grant an extension for greater than 14 days for the Contractor's corrective action letter. The Contractor shall proceed and not assume that an extension will be granted until so notified by the Technical Project Officer or Administrative Project Officer.

9.2.6 In the case of Section 9.2.4.2 or 9.2.4.3, if new SOPs are required to be written, or if existing SOPs are required to be rewritten or amended because of deficiencies and subsequent corrective action implemented by the Contractor, the Contractor shall write/amend the SOPs per the requirements listed in Exhibit E, Section 4.

9.2.7 For unacceptable QB sample performance (Section 9.2.4.3), the EPA may take, but is not limited to the following actions: reduction in the number of samples shipped to the laboratory; suspension of sample shipment; an on-site laboratory inspection; a full data package audit; and/or require the laboratory to analyze a Remedial QB sample; and/or contract sanctions.

9.2.8 A Remedial QB Audit is a unique analytical case containing only QB samples. A Remedial QB Audit may be scheduled by the National Program Office with the Contractor(s) for any of the following reasons: unacceptable PE sample performance, unacceptable QB sample performance, and/or major change in the laboratory (e.g., relocation, new owner, or high turn-over of key personnel). Sections 9.2.2 through 9.2.7 apply to the Remedial QB Audit process.

| *9.2.9* *If the Contractor fails to adhere to the requirements listed in Section 9, the Contractor may expect, but the Agency is not limited to, the following actions: reduction in the number of samples sent under the contract; suspension of sample shipment to the Contractor; a full data package audit; an on-site laboratory inspection; a Remedial QB sample; and/or contract sanctions.*

| *10.0* GC/MS *AND GC/EC* TAPE AUDITS

| *10.1* Overview. Periodically, the Agency requests the GC/MS *and GC/EC* magnetic tapes from Contractors for a specific Case in order to accomplish tape audits. Generally, tape submissions and audits are requested for the following reasons.

- Program overview,
- Indication of data quality problems,
- Support for on-site audits, and
- Specific Regional requests.

| *10.1.1* Depending upon the reason for an audit, the tapes from a recent Case, a specific Case, or a laboratory evaluation sample may be requested. Tape audits provide a mechanism to assess adherence to contractual requirements and to ensure the consistency of data reported on the | hardcopy/*electronic deliverables* with that generated on the GC/MS *and* | *GC/EC* tapes. This function provides external monitoring of Program QC requirements and checks adherence of the Contractor to internal QA procedures. In addition, tape audits enable the Agency to evaluate the utility, precision, and accuracy of the analytical methods.

| *10.1.2* The Contractor shall store <u>all</u> raw and processed GC/MS *and GC/EC* data on magnetic tape, in appropriate instrument manufacturer's format, | *uncompressed, and with no security codes*. This tape shall include | data for samples, *all QC samples*, blanks, matrix spikes, matrix spike duplicates, initial calibrations, continuing calibrations, | *calibration verification standards, including resolution check* | *samples and performance evaluation mixtures, GPC single component and* | *multicomponent and Florisil cartridge check samples and associated* | *calibrations*, and instrument performance check *solutions* (BFB and DFTPP) as well as all Contractor-generated spectral libraries and quantitation reports required to generate the data package. The Contractor shall maintain a written reference logbook of tape files of the EPA sample number, calibration data, standards, blanks, matrix spikes, and matrix spike duplicates. The logbook shall include EPA sample numbers and standard and blank IDs, identified by Case and Sample Delivery Group.

| *10.1.3* The Contractor is required to retain the GC/MS *and GC/EC* tapes for 365 days after submission of the reconciled Complete SDG File. When | submitting GC/MS *and GC/EC* tapes to the Agency, the following materials shall be delivered in response to the request.

| *10.1.3.1* All associated raw data files for samples, all QC samples, blanks, matrix spikes, matrix spike duplicates, initial calibrations, | continuing calibrations, *calibration verification standards,* | *including resolution check samples and performance evaluation* | *mixtures, GPC single component and multicomponent Florisil* | *cartridge check samples and associated calibrations*, and instrument performance check solutions (BFB and DFTPP).

| *10.1.3.2* All processed data files and quantitation output files associated with the raw data files described in Section *10*.1.3.1.

| *10.1.3.3* All associated identifications and calculation files *(method files)* used to generate the data submitted in the data package.

| *10.1.3.4* All Contractor-generated mass spectral library files (NIST/EPA/NIH and/or Wiley, or equivalent, library not required).

| *10.1.3.5* A copy of the Contractor's written reference logbook relating tape files to EPA sample number, calibration data, standards, blanks, matrix spikes, and matrix spike duplicates. The logbook shall include EPA sample numbers and lab file identifiers for all samples, blanks, and standards, identified by Case and Sample Delivery Group.

| *10.1.3.6* **A directory of *all* files on each tape, *including all subdirectories and the files contained therein.***
|
| *10.1.3.7* A copy of the completed sample data package.

| *10.1.3.8* A statement attesting to the completeness of the GC/MS *and GC/EC* data tape submission, signed and dated by the Contractor's laboratory manager. The Contractor shall also provide a statement attesting that the data reported have not been altered in any way. These statements shall be part of a cover sheet that includes the following information relevant to the data tape submission:

- Contractor name,
- Date of submission,
- Case number,
- SDG number,
- GC/MS *and GC/EC* make and model number,
- Software version,
- Disk drive type (e.g., CDC, PRIAM, etc.),
- File transfer method (e.g., DSD, DTD, FTP, Aquarius, etc.), and
- *Data System Computer,*
- *System Operating Software,*
- *Data System Network,*
- *Tape Backup Software,*
- *Tape Backup Hardware,*

- *Data Analysis Software,*
- *Fraction, and*
- *Volume of data (in Mb) backed up on each tape*
- Names and telephone numbers of two Contractor contacts for further information regarding the submission.

10.2 Submission of the GC/MS *and GC/EC Tapes*. Upon request of the Administrative Project Officer, the Contractor shall send the required GC/MS *and/or GC/EC* tapes and all necessary documentation to the EPA designated recipient (e.g., QATS) within seven (7) days of notification. An alternate delivery schedule may be proposed by the Contractor, but it is the sole decision of the Agency, represented either by the Technical Project Officer or Administrative Project Officer, to approve or disapprove the alternate delivery schedule. If an alternate delivery schedule is proposed, the Contractor shall describe in a letter to the Technical Project Officer, Administrative Project Officer, and the Contracting Officer why he/she is unable to meet the delivery schedule listed in this section. The Technical Project Officer/Administrative Project Officer will not grant an extension for greater than seven days for submission of the GC/MS *and/or GC/EC* tape. The Contractor shall proceed and not assume that an extension will be granted until so notified by the Technical Project Officer and/or Administrative Project Officer.

NOTE: The GC/MS *and GC/EC* tapes shall be shipped according to the procedures in Exhibit F.

10.3 Responding to the GC/MS *and GC/EC* Tape Audit Report. After completion of the GC/MS *and GC/EC* tape audit, the Agency may send a copy of the GC/MS *and GC/EC* tape audit report to the Contractor or may discuss the GC/MS *and GC/EC* tape audit report at an on-site laboratory evaluation. In a detailed letter to the Technical Project Officer and Administrative Project Officer, the Contractor shall discuss the corrective actions implemented to resolve the deficiencies listed in the GC/MS *and GC/EC* tape audit report within 14 days of receipt of the report.

10.3.1 An alternate delivery schedule may be proposed by the Contractor, but it is the sole decision of the Agency, represented either by the Technical Project Officer or Administrative Project Officer, to approve or disapprove the alternate delivery schedule. If an alternate delivery schedule is proposed, the Contractor shall describe in a letter to the Technical Project Officer, Administrative Project Officer, and the Contracting Officer why he/she is unable to meet the delivery schedule listed in this section. The Technical Project Officer/Administrative Project Officer will not grant an extension for greater than 14 days for the Contractor's response letter to the GC/MS *and GC/EC* tape report. The Contractor shall proceed and not assume that an extension will be granted until so notified by the Technical Project Officer and/or Administrative Project Officer.

| *10.3.2* If new SOPs are required to be written or SOPs are required to be amended because of the deficiencies and the subsequent corrective action implemented by the Contractor, the Contractor shall write/amend and submit the SOPs per the requirements listed in Section 4.

| *10.3.3* Maintenance of the Magnetic Tape Storage Device

| *10.3.3.1* The Contractor shall certify that the tape head alignment on the magnetic tape storage device is in compliance with the ANSI standards for nine track magnetic tapes. If the Contractor does not have documentation of alignment within the last 12 months, the Contractor must perform or have performed the manufacturer's documented head alignment procedure within 60 days of contract award. This is generally performed with a "skew" tape, certified to be in conformance with ANSI standards. The alignment must be performed by qualified personnel. The tape head alignment must be performed at a minimum once every 12 months or when there is evidence that the tape head may be out of alignment.

| *10.3.3.2* The tape system, including recording head, must be in conformance with the manufacturer's physical and electrical standards. Alignment of the remaining components of the tape system such as the retracting arms, must be performed at intervals not to exceed 24 months. If the Contractor cannot demonstrate that the remaining components of the tape system are in alignment, then the Contractor must perform or have performed the manufacturer's recommended alignment procedure.

| *10.3.4 Record of Maintenance of the Magnetic Tape Storage Device*

Documentation of maintenance, alignment, and repair procedures must be kept in an instrument maintenance log book for each tape device and data system. Also include any local area network components that provide a means for the transmission of data to or from the instrument data system and the tape system. Maintenance entries must include serial number, property number (if applicable), data and time of repair, name of person performing maintenance, problem description, problem resolution, date and time of failure (if applicable), and date and time placed back in service. Copies of repairs shall be kept in the maintenance documentation. Documentation of 1) data system, and 2) tape system maintenance and alignments, for the last 24 months must be made available upon
| written request of the Technical Project Officer or *Administrative*
| *Project Officer* or during a laboratory on-site evaluation. The
| Contractor shall always submit a GC/MS *and GC/EC* tape from a tape system in conformance with the manufacturer's physical and electrical standards and alignment according to manufacturer's procedures.

| *10.4* Corrective Actions. If the Contractor fails to adhere to the
| requirements listed in Section *10*, the Contractor may expect, but the Agency is not limited to, the following actions: reduction in the number of samples sent under the contract, suspension of sample shipment
| to the Contractor, an on-site laboratory evaluation, a GC/MS *and/or*

| *GC/EC* tape audit, a data package audit, a remedial laboratory evaluation sample, and/or contract sanctions.

11.0 DATA PACKAGE AUDITS

11.1 Overview. Data package audits are performed by the Agency for program overview and specific Regional concerns and to assess the technical quality of the data and evaluate overall Contractor performance. They provide the Agency with an in-depth inspection and evaluation of the Case data package with regard to achieving QA/QC acceptability. Data packages are periodically selected from recently received Cases. They are evaluated for the technical quality of hardcopy raw data, quality assurance, and adherence to contractual requirements. A thorough review of the raw data is completed, including: a check of instrument printouts, quantitation reports, chromatograms, spectra, library searches and other documentation for deviations from the contractual requirements, a check for transcription and calculation errors, a review of the qualifications of the Contractor personnel involved with the Case, and a review of *the latest version of all* SOPs on file. Standardized procedures have been established to assure uniformity of the auditing process.

11.2 Responding to the Data Package Audit Report. After completing the data package audit, the Agency may send a copy of the data package audit report to the Contractor or may discuss the data package audit report at an on-site laboratory evaluation. In a detailed letter to the Technical Project Officer and the Administrative Project Officer, the Contractor shall discuss the corrective actions implemented to resolve the deficiencies listed in the data package audit report within 14 days of receipt of the report.

11.2.1 An alternate delivery schedule may be proposed by the Contractor, but it is the sole decision of the Agency, represented either by the Technical Project Officer or Administrative Project Officer, to approve or disapprove the alternate delivery schedule. If an alternate delivery schedule is proposed, the Contractor shall describe in a letter to the Technical Project Officer, Administrative Project Officer, and the Contracting Officer, why he/she is unable to meet the delivery schedule listed in this section. The Technical Project Officer/Administrative Project Officer will not grant an extension for greater than 14 days for the Contractor's response letter to the data package report. The Contractor shall proceed and not assume that an extension will be granted until so notified by the Technical Project Officer and/or Administrative Project Officer.

11.2.2 If new SOPs are required to be written or SOPs are required to be amended because of the deficiencies and the subsequent corrective action implemented by the Contractor, the Contractor shall write/amend and submit the SOPs per the requirements listed in Section 4.

11.3 Corrective Actions. If the Contractor fails to adhere to the requirements listed in Section *11*, the Contractor may expect, but the Agency is not limited to, the following actions: reduction in the numbers of samples sent under the contract, suspension of sample shipment to the Contractor, an on-site laboratory evaluation, a GC/MS *and/or GC/EC* tape audit, a data package audit, a remedial laboratory evaluation sample, and/or contract sanctions.

| *12.0* ON-SITE LABORATORY EVALUATIONS

| *12.1* Overview. At a frequency dictated by a Contractor's performance, the Administrative Project Officer, Technical Project Officer, or the Contracting Officer will conduct an on-site laboratory evaluation. On-site laboratory evaluations are carried out to monitor the Contractor's ability to meet selected terms and conditions specified in the contract. The evaluation process incorporates two separate categories: a quality assurance evaluation and an evidentiary audit.

| *12.2* Quality Assurance On-Site Evaluation. Quality assurance evaluators inspect the Contractor's facilities to verify the adequacy and maintenance of instrumentation, the continuity of personnel meeting experience or education requirements, and the acceptable performance of analytical and QC procedures.

| *12.2.1* The Contractor shall expect that items to be monitored will include, but not be limited to, the following items:

- Size and appearance of the facility,
- Quantity, age, availability, scheduled maintenance, and performance of instrumentation,
- Availability, appropriateness, and utilization of the QAP and SOPs,
- Staff qualifications and experience, and personnel training programs,
- Reagents, standards, and sample storage facilities,
- Standard preparation logbooks and raw data,
- Bench sheets and analytical logbook maintenance and review, and
- Review of the Contractor's sample analysis/data package inspection/data management procedures.

| *12.2.2* Prior to an on-site evaluation, various documentation pertaining to performance of the specific Contractor is integrated in a profile package for discussion during the evaluation. Items that may be included are previous on-site reports, laboratory evaluation sample
| scores, Regional review of data, Regional QA materials, GC/MS *and*
| *GC/EC* tape audit reports, data audit reports, results of CCS, and data trend reports.

| *12.3* Evidentiary Audit. Evidence auditors conduct an on-site laboratory evaluation to determine if Contractor policies and procedures are in place to satisfy evidence handling requirements as stated in Exhibit F. The evidence audit comprises a procedural audit, an audit of written SOPs, and an audit of analytical project file documentation.

| *12.3.1* Procedural Audit. The procedural audit consists of review and examination of actual standard operating procedures and accompanying documentation for the following Contractor operations: sample receiving, sample storage, sample identification, sample security, sample tracking (from receipt to completion of analysis), and analytical project file organization and assembly.

| *12.3.2* Written SOPs Audit. The written SOPs audit consists of review and examination of the written SOPs to determine if they are accurate and complete for the following Contractor operations: sample receiving, sample storage, sample identification, sample security, sample tracking (from receipt to completion of analysis), and analytical project file organization and assembly.

| *12.3.3* Analytical Project File Evidence Audit. The analytical project file evidence audit consists of review and examination of the analytical project file documentation. The auditors review the files to determine:

- The accuracy of the document inventory,
- The completeness of the file,
- The adequacy and accuracy of the document numbering system,
- Traceability of sample activity,
- Identification of activity recorded on the documents, and
- Error correction methods.

| *12.4* Discussion of the On-Site Team's Findings. During the debriefing, the auditors present their findings and recommendations for corrective actions necessary to the Contractor personnel.

| *12.5* Corrective Action Reports for Follow-Through to Quality Assurance and Evidentiary Audit Reports. Following an on-site laboratory evaluation, quality assurance and/or evidentiary audit reports which discuss deficiencies found during the on-site evaluation may be sent to the Contractor. In a detailed letter, the Contractor shall discuss the corrective actions implemented to resolve the deficiencies discussed during the on-site evaluation and discussed in the report(s) to the Technical Project Officer and the Administrative Project Officer within 14 days of receipt of the report.

| *12.5.1* An alternate delivery schedule may be proposed by the Contractor, but it is the sole decision of the Agency, represented either by the Technical Project Officer or Administrative Project Officer, to approve or disapprove the alternate delivery schedule. If an alternate delivery schedule is proposed, the Contractor shall describe in a letter to the Technical Project Officer, Administrative Project Officer, and the Contracting Officer why he/she is unable to meet the delivery schedule listed in this section. The Technical Project Officer/Administrative Project Officer will not grant an

extension for greater than 14 days for the Contractor's response letter to the quality assurance and evidentiary audit report. The Contractor shall proceed and not assume that an extension will be granted until so notified by the Technical Project Officer and/or Administrative Project Officer.

| *12.5.2* If new SOPs are required to be written or SOPs are required to be amended because of the deficiencies and the subsequent corrective action implemented by the Contractor, the Contractor shall write/amend and submit the SOPs per the requirements listed in Section 4.

| *12.6* Corrective Actions. If the Contractor fails to adhere to the
| requirements listed in Section *12*, the Contractor may expect, but the Agency is not limited to, the following actions: reduction in the number of samples sent under the contract, suspension of sample shipment
| to the Contractor, an on-site laboratory evaluation, a GC/MS *and/or*
| *GC/EC* tape audit, a data package audit, a remedial laboratory evaluation sample, and/or contract sanctions.

| *13.0* QUALITY ASSURANCE AND DATA TREND ANALYSIS

| *13.1* Data submitted by Contractors are subject to review from several aspects: compliance with contract-required QC, usability, and full data package evaluation. Problems resulting from any of these reviews may
| determine the need for a GC/MS *and GC/EC* tape audit, an on-site laboratory evaluation and/or a remedial laboratory evaluation sample. In addition, QC prescribed in the methods provides information that is continually used by the Agency to assess sample data quality, Contractor data quality and Program data quality via data trend analysis. Trend analysis is accomplished by entering data into a computerized database. Statistical reports that evaluate specific anomalies or disclose trends in many areas, including the following, are generated from this database:

- Surrogate spike recovery,
- Laboratory evaluation sample results,
- Blanks,
- GC/MS instrument performance checks (BFB and DFTPP),
- Initial and continuing calibration data, and
- Other QC and method parameters.

| *13.2* Program-wide statistical results are used to rank Contractors in order to observe the relative performance of each Contractor using a given protocol against its peers. The reports are also used to identify trends within Contractors. The results of many of these trend analyses are included in the overall evaluation of a Contractor's performance, and are reviewed to determine if corrective action or an on-site laboratory evaluation may be required to ensure that the Contractor can meet the QA/QC requirements of the contract. Contractor performance over time is monitored using these trend analysis techniques to detect departures of Contractor output from required or desired levels of quality control, and to provide an early warning of Contractor QA/QC problems which may not be apparent from the results of an individual Case.

| *13.3* As a further benefit to the Program, the database provides the information needed to establish performance-based criteria in updated analytical protocols, where advisory criteria have been previously used. The vast empirical data set produced by Contractors is carefully analyzed, with the results augmenting theoretical and research-based performance criteria. The result is a continuously monitored set of quality control and performance criteria specifications of what is routinely achievable and expected of environmental chemistry Contractors engaged in mass production analysis of environmental samples. This, in turn, assists the Agency in meeting its objectives of obtaining data of known and documented quality.

| *14.0* DATA MANAGEMENT

| *14.1* Data management procedures are defined as procedures specifying the acquisition or entry, update, correction, deletion, storage, and security of computer-readable data and files. These procedures shall be in written form and contain a clear definition for all databases and files used to generate or resubmit deliverables. Key areas of concern include system organization (including personnel and security), documentation operations, traceability, and quality control.

| *14.2* Data manually entered from hardcopy shall be subject to quality control and the error rates estimated. Systems shall prevent entry of incorrect or out-of-range data and alert data entry personnel of errors. In addition, data entry error rates shall be estimated and recorded on a monthly basis by reentering a statistical sample of the data entered and calculating discrepancy rates by data element.

| *14.3* The record of changes in the form of corrections and updates to data originally generated, submitted, and/or resubmitted shall be documented to allow traceability of updates. Documentation shall include the following for each change.

- Justification or rationale for the change.
- Initials of the person making the change(s). Data changes shall be implemented and reviewed by a person or group independent of the source generating the deliverable.
- Documentation of changes shall be retained according to the schedule of the original deliverable.
- Resubmitted diskettes or other deliverables shall be reinspected as a part of the Contractor's internal inspection process prior to resubmission. The entire deliverable, not just the changes, shall be inspected.
- The Contractor's laboratory manager shall approve changes to originally submitted deliverables.
- Documentation of data changes may be requested by Contractor auditors.

| *14.4* Life cycle management procedures shall be applied to computer software systems developed by the Contractor to be used to generate and edit contract deliverables. Such systems shall be thoroughly tested and documented prior to utilization.

| *14.4.1* A software test and acceptance plan including test requirements, test results, and acceptance criteria shall be developed, followed, and available in written form.

| *14.4.2* System changes shall not be made directly to production systems generating deliverables. Changes shall be made first to a development system and tested prior to implementation.

| *14.4.3* Each version of the production system will be given an identification number, date of installation, date of last operation, and archived.

| *14.4.4* System and operations documentation shall be developed and maintained for each system. Documentation shall include a user's manual and an operations and maintenance manual.

| *14.4.5* This documentation shall be available for on-site review and/or upon
| written request by the *Technical Project Officer* or *Administrative
| Project Officer*.

| *14.5* Individual(s) responsible for the following functions shall be identified.

- System operation and maintenance, including documentation and training,
- Database integrity, including data entry, data updating and quality control, and
- Data and system security, backup, and archiving.

EXHIBIT F

CHAIN-OF-CUSTODY, DOCUMENT CONTROL, AND WRITTEN STANDARD OPERATING PROCEDURES

Exhibit F - Chain-of-Custody, Document Control, and
Written Standard Operating Procedures

Table of Contents

1.0 INTRODUCTION

1.1 A sample is physical evidence collected from a facility or from the environment. Controlling evidence is an essential part of the hazardous waste investigation effort. To ensure that the Environmental Protection Agency's (EPA) sample data and records supporting sample-related activities are admissible and have weight as evidence in future litigation, Contractors are required to maintain EPA samples under chain-of-custody and to account for all samples and supporting records of sample handling, preparation, and analysis. Contractors shall maintain sample identity, sample custody, and all sample-related records according to the requirements in this exhibit.

1.2 The purposes of the evidence requirements include:

- Ensuring traceability of samples while in the possession of the Contractor.
- Ensuring custody of samples while in the possession of the Contractor.
- Ensuring the integrity of sample identity while in the possession of the Contractor.
- Ensuring sample-related activities are recorded on documents or in other formats for EPA sample receipt, storage, preparation, analysis, and disposal.
- Ensuring all laboratory records for each specified Sample Delivery Group will be accounted for when the project is completed.
- Ensuring that all laboratory records directly related to EPA samples are assembled and delivered to EPA or, prior to delivery, are available upon EPA's request.

2.0 STANDARD OPERATING PROCEDURES

The Contractor shall implement the following standard operating procedures for sample receiving, sample identification, sample security, sample storage, sample tracking and document control, computer-resident sample data control, and complete sample delivery group file organization and assembly to ensure accountability of EPA sample chain-of-custody as well as control of all EPA sample-related records.

2.1 Sample Receiving

2.1.1 The Contractor shall designate a sample custodian responsible for receiving EPA samples.

2.1.2 The Contractor shall designate a representative to receive EPA samples in the event that the sample custodian is not available.

2.1.3 Upon receipt, the condition of shipping containers and sample containers shall be inspected and recorded on Form DC-1 by the sample custodian or his/her representative.

2.1.4 Upon receipt, the condition of the custody seals (intact/broken) shall be inspected and recorded on Form DC-1 by the sample custodian or his/her representative.

2.1.5 The sample custodian or his/her representative shall verify and record on Form DC-1 the presence or absence of the following documents accompanying the sample shipment:

- Custody seals,
- Chain-of-custody records,
- Traffic reports or packing lists,
- Airbills or airbill stickers, and
- Sample tags.

2.1.6 The sample custodian or his/her representative shall verify and record on Form DC-1 the agreement or disagreement of information recorded on all documents received with samples and information recorded on sample containers.

2.1.7 The sample custodian or his/her representative shall record the following information on Form DC-1 as samples are received and inspected:

- Custody seal numbers when present,
- Airbill or airbill sticker numbers,
- Sample tags listed/not listed on chain-of-custody records,
- *Cooler temperature,*

- Date of receipt,
- Time of receipt,
- EPA sample numbers,
- Sample tag numbers,
- Assigned laboratory numbers,
- Samples delivered by hand, and
- Problems and discrepancies.

2.1.8 The sample custodian or his/her representative shall sign, date, and record the time on all accompanying forms, when applicable, at the time of sample receipt (for example, chain-of-custody records, traffic reports or packing lists, and airbills). Note: Initials are not acceptable.

2.1.9 The Contractor shall contact the Sample Management Office (SMO) to resolve problems and discrepancies including, but not limited to, absent documents, conflicting information, absent or broken custody seals, *absent temperature indicator bottle,* and unsatisfactory sample condition (for example, leaking sample container).

2.1.10 The Contractor shall record resolution of problems and discrepancies by SMO.

2.2 Sample Identification

2.2.1 The Contractor shall maintain the identity of EPA samples and prepared samples (including extracted samples, digested samples, and distilled samples) throughout the laboratory.

2.2.2 Each sample and sample preparation container shall be labeled with the SMO number or a unique laboratory sample identification number.

2.3 Sample Security

2.3.1 The Contractor shall demonstrate that EPA sample custody is maintained from receiving through retention or disposal. A sample is in custody if:

- It is in your possession; or
- It is in your view after being in your possession; or
- It is locked in a secure area after being in your possession; or
- It is in a designated secure area. (Secure areas shall be accessible only to authorized personnel.)

2.3.2 The Contractor shall demonstrate security of designated secure areas.

2.4 Sample Storage

The Contractor shall designate storage areas for EPA samples and prepared samples.

2.5 Sample Tracking and Document Control

2.5.1 The Contractor shall record all activities performed on EPA samples.

2.5.2 Titles which identify the activities recorded shall be printed on each page of all laboratory documents. (Activities include, but are not limited to, sample receipt, sample storage, sample preparation, and sample analysis.) When a document is a record of analysis, the instrument type and parameter group (for example, GC/MS-VOA) shall be included in the title.

2.5.3 When columns are used to organize information recorded on laboratory documents, the information recorded in the columns shall be identified in a column heading.

2.5.4 Reviewers' signatures shall be identified on laboratory documents when reviews are conducted. Note: Individuals recording review comments on computer-generated raw data are not required to be identified unless the written comments address data validity.

2.5.5 The laboratory name shall be identified on preprinted laboratory documents.

2.5.6 Each laboratory document entry shall be dated with the month/day/year (for example, 01/01/90) and signed (or initialed) by the individual(s) responsible for performing the recorded activity at the time the activity is recorded.

2.5.7 Notations on laboratory documents shall be recorded in ink.

2.5.8 Corrections to laboratory documents and raw data shall be made by drawing single lines through the errors and entering the correct information. Information shall not be obliterated or rendered unreadable. Corrections and additions to information shall be signed (or initialed) and dated.

2.5.9 Unused portions of laboratory documents shall be lined-out.

2.5.10 Pages in bound and unbound logbooks shall be sequentially numbered.

2.5.11 Instrument-specific run logs shall be maintained to enable the reconstruction of run sequences.

2.5.12 Logbook entries shall be in chronological order.

2.5.13 Logbook entries shall include only one Sample Delivery Group (SDG) per page, except in the events where the SDGs "share" QC samples (for example, instrument run logs and extraction logs).

2.5.14 Information inserted into laboratory documents shall be affixed permanently in place. The individual responsible for inserting

information shall sign and date across the insert and logbook page at the time information is inserted.

2.5.15 The Contractor shall document disposal or retention of EPA samples, remaining portions of samples, and prepared samples.

2.6 Computer-Resident Sample Data Control

2.6.1 Contractor personnel responsible for original data entry shall be identified at the time of data input.

2.6.2 The Contractor shall make changes to electronic data in a manner which ensures that the original data entry is preserved, the editor is identified, and the revision date is recorded.

2.6.3 The Contractor shall routinely verify the accuracy of manually entered data, electronically entered data, and data acquired from instruments.

2.6.4 The Contractor shall routinely verify documents produced by the electronic data collection system to ensure accuracy of the information reported.

2.6.5 The Contractor shall ensure that the electronic data collection system is secure.

2.6.5.1 The electronic data collection system shall be maintained in a secure location.

2.6.5.2 Access to the electronic data collection system functions shall be limited to authorized personnel through utilization of software security techniques (for example, log-ons or restricted passwords).

2.6.5.3 Electronic data collection systems shall be protected from the introduction of external programs or software (for example, viruses).

2.6.6 The Contractor shall designate archive storage areas for electronic data and the software required to access the data.

2.6.7 The Contractor shall designate an individual responsible for maintaining archives of electronic data, including the software.

2.6.8 The Contractor shall maintain the archives of electronic data and necessary software in a secure location. (Secure areas shall be accessible only to authorized personnel.)

2.7 Complete Sample Delivery Group File (CSF) Organization and Assembly

2.7.1 The Contractor shall designate a document control officer responsible for the organization and assembly of the CSF.

2.7.2 The Contractor shall designate a representative responsible for the organization and assembly of the CSF in the event that the document control officer is not available.

2.7.3 The Contractor shall maintain documents relating to the CSF in a secure location.

2.7.4 All original laboratory forms and copies of SDG-related logbook pages shall be included in the CSF.

2.7.5 Copies of laboratory documents in the CSF shall be photocopied in a manner to provide complete and legible replicates.

2.7.6 Documents relevant to each SDG including, but not limited to, the following shall be included in the CSF:

- logbook pages,
- benchsheets,
- mass spectra,
- chromatograms,
- screening records,
- preparation records,
- re-preparation records,
- analytical records,
- re-analysis records,
- records of failed or attempted analysis,
- custody records,
- sample tracking records,
- raw data summaries,
- computer printouts,
- correspondence,
- FAX originals,
- library search results, and
- other.

2.7.7 The document control officer or his/her representative shall ensure that sample tags are encased in clear plastic bags before placing them in the CSF.

2.7.8 CSF documents shall be organized and assembled on an SDG-specific basis.

2.7.9 Original documents which include information relating to more than one SDG (for example, chain-of-custody records, traffic reports, calibration logs) shall be filed in the CSF of the lowest SDG number, and copies of these originals shall be placed in the other CSF(s). The document control officer or his/her representative shall record the following statement on the copies in dark ink:

COPY
ORIGINAL DOCUMENTS ARE INCLUDED IN CSF _____

_____
Signature

_____
Date

2.7.10 All CSFs shall be submitted with a completed Form DC-2. All resubmitted CSFs shall be submitted with a new or revised Form DC-2.

2.7.11 Each item in the CSF and resubmitted CSFs shall be inventoried and assembled in the order specified on Form DC-2. Each page of the CSF shall be stamped with a sequential number. Page number ranges shall

be recorded in the columns provided on Form DC-2. Intentional gaps in the page numbering sequence shall be recorded in the "Comments" section on Form DC-2. When inserting new or inadvertently omitted documents, the Contractor shall identify them with unique accountable numbers. The unique accountable numbers and the locations of the documents shall be recorded in the "Other Records" section on Form DC-2.

2.7.12 Before shipping each CSF, the document control officer or his/her representative shall verify the agreement of information recorded on all documentation and ensure that the information is consistent and the CSF is complete.

2.7.13 The document control officer or his/her representative shall document the shipment of deliverable packages including what was sent, to whom, the date, and the carrier used.

2.7.14 Shipments of deliverable packages, including resubmittals, shall be sealed with custody seals by the document control officer or his/her representative in a manner such that opening the packages would break the seals.

2.7.15 Custody seals shall be signed and dated by the document control officer or his/her representative when sealing deliverable packages.

3.0 WRITTEN STANDARD OPERATING PROCEDURES (SOPS)

The Contractor shall develop and implement the following written SOPs for sample receiving, sample identification, sample security, sample storage, sample tracking and document control, computer-resident sample data control, and CSF file organization and assembly to ensure accountability for EPA sample chain-of-custody and control of all EPA sample-related records.

3.1 Sample Receiving

3.1.1 The Contractor shall have written SOPs for sample receiving which accurately reflect the procedures used by the laboratory.

3.1.2 The written SOPs for sample receiving shall ensure that the procedures listed below are in use at the laboratory.

3.1.2.1 The condition of shipping containers and sample containers are inspected and recorded on Form DC-1 upon receipt by the sample custodian or his/her representative.

3.1.2.2 The condition of custody seals are inspected and recorded on Form DC-1 upon receipt by the sample custodian or his/her representative.

3.1.2.3 The presence or absence of the following documents accompanying the sample shipment is verified and recorded on Form DC-1 by the sample custodian or his/her representative:

- Custody seals,
- Chain-of-custody records,
- Traffic reports or packing lists,
- Airbills or airbill stickers, and
- Sample tags.

3.1.2.4 The agreement or disagreement of information recorded on shipping documents with information recorded on sample containers is verified and recorded on Form DC-1 by the sample custodian or his/her representative.

3.1.2.5 The following information is recorded on Form DC-1 by the sample custodian or his/her representative as samples are received and inspected:

- Custody seal numbers when present,
- Airbill or airbill sticker numbers,
- Sample tag numbers listed/not listed on chain-of-custody records,
- *Cooler temperature,*

- Date of receipt,
- Time of receipt,
- EPA sample numbers,
- Sample tag numbers,
- Assigned laboratory numbers,
- Samples delivered by hand, and
- Problems and discrepancies.

3.1.2.6 All accompanying forms are signed, dated, and the time is recorded, when applicable, at the time of sample receipt (for example, chain-of-custody records, traffic reports or packing lists, and airbills) by the sample custodian or his/her representative.

3.1.2.7 SMO is contacted to resolve problems and discrepancies including, but not limited to, absent documents, conflicting information, absent or broken custody seals, *absent temperature indicator bottle,* and unsatisfactory sample condition (for example, leaking sample container).

3.1.2.8 The resolution of problems and discrepancies by SMO is recorded.

3.2 Sample Identification

3.2.1 The Contractor shall have written SOPs for sample identification which accurately reflect the procedures used by the laboratory.

3.2.2 The written SOPs for sample identification shall ensure that the procedures listed below are in use at the laboratory.

3.2.2.1 The identity of EPA samples and prepared samples is maintained throughout the laboratory:

- When the Contractor assigns unique laboratory sample identification numbers, the written SOPs shall include a description of the procedure used to assign these numbers,
- When the Contractor uses prefixes or suffixes in addition to laboratory sample identification numbers, the written SOPs shall include their definitions, and
- When the Contractor uses methods to uniquely identify fractions/parameter groups and matrix type, the written SOPs shall include a description of these methods.

3.2.2.2 Each sample and sample preparation container is labeled with the SMO number or a unique laboratory sample identification number.

3.3 Sample Security

3.3.1 The Contractor shall have written SOPs for sample security which accurately reflect the procedures used by the laboratory.

3.3.2 The written SOPs for sample security shall include the items listed below.

3.3.2.1 Procedures which ensure the following:

- Sample custody is maintained, and
- The security of designated secure areas is maintained.

3.3.2.2 A list of authorized personnel who have access to locked storage areas.

3.4 Sample Storage

3.4.1 The Contractor shall have written SOPs for sample storage which accurately reflect the procedures used by the laboratory.

3.4.2 The written SOPs for sample storage shall describe locations, contents, and identities of all storage areas for EPA samples and prepared samples in the laboratory.

3.5 Sample Tracking and Document Control

3.5.1 The Contractor shall have written SOPs for sample tracking and document control which accurately reflect the procedures used by the laboratory.

3.5.2 The written SOPs for sample tracking and document control shall include the items listed below.

3.5.2.1 Examples of all laboratory documents used during sample receiving, sample storage, sample transfer, sample analyses, CSF organization and assembly, and sample retention or disposal.

3.5.2.2 Procedures which ensure the following:

- All activities performed on EPA samples are recorded;
- Titles which identify the activities recorded are printed on each page of all laboratory documents;
- Information recorded in columns is identified with column headings;
- Reviewers' signatures are identified on laboratory documents;
- The laboratory name is included on preprinted laboratory documents;
- Laboratory document entries are signed and dated with the

month/day/year (for example, 01/01/90);

- Entries on all laboratory documents are recorded in ink;
- Corrections and additions to laboratory documents are made by drawing single lines through the errors, entering the correct information, and initialing and dating the new information;
- Unused portions of laboratory documents are lined-out;
- Pages in bound and unbound logbooks are sequentially numbered;
- Instrument-specific run logs are maintained to enable the reconstruction of run sequences;
- Logbook entries are recorded in chronological order;
- Entries are recorded for only one SDG on a page, except in the events where SDGs "share" quality control (QC) samples (for example, instrument run logs and extraction logs);
- Information inserted in laboratory documents is affixed permanently, signed, and dated across the insert; and
- The retention or disposal of EPA samples, remaining portions of samples, and prepared samples is documented.

3.6 Computer-Resident Sample Data Control

3.6.1 The Contractor shall have written SOPs for computer-resident sample data control which accurately reflect the procedures used by the laboratory.

3.6.2 The written SOPs for computer-resident sample data control shall include the items listed below.

3.6.2.1 Procedures which ensure the following:

- Contractor personnel responsible for original data entry are identified;
- Changes to electronic data are made such that the original data entry is preserved, the editor is identified, and the revision date is recorded;
- The accuracy of manually entered data, electronically entered data, and data acquired from instruments is verified;
- Report documents produced by the electronic data collection system are routinely verified to ensure the accuracy of the information reported;
- Electronic data collection system security is maintained; and
- Archives of electronic data and accompanying software are maintained in a secure location.

3.6.2.2 Descriptions of archive storage areas for the electronic data and the software required to access data archives.

3.6.2.3 A list of authorized personnel who have access to electronic data collection system functions and to archived data.

3.7 CSF Organization and Assembly

3.7.1 The Contractor shall have written SOPs for CSF organization and assembly which accurately reflect the procedures used by the laboratory.

3.7.2 The written SOPs for CSF organization and assembly shall ensure that the procedures listed below are in use at the laboratory.

- Documents relating to the CSF are maintained in a secure location.
- All original laboratory forms and copies of SDG-related logbook pages are included in the CSF.
- Laboratory documents are photocopied in a manner to provide complete and legible replicates.
- All documents relevant to each SDG are included in the CSF.
- Sample tags are encased in clear plastic bags by the document control officer or his/her representative before placing them in the CSF.
- The CSF is organized and assembled on an SDG-specific basis.
- Copies are referenced to originals in the event that an original document contains information relating to more than one SDG.
- Each CSF is submitted with a completed Form DC-2, and resubmitted CSFs are submitted with a new or revised Form DC-2.
- Each page of the CSF is stamped with a sequential number and the page number ranges are recorded in the columns provided on Form DC-2.
- Consistency and completeness of the CSF is verified by the document control officer or his/her representative.
- Shipments of deliverable packages are documented by the document control officer or his/her representative.
- Deliverable packages are shipped by the document control officer or his/her representative using custody seals in a manner such that opening the packages would break the seals.
- Custody seals are signed and dated by the document control officer or his/her representative before placing them on deliverable packages.

EXHIBIT G

GLOSSARY OF TERMS

ALIQUOT - a measured portion of a sample, or solution, taken for sample preparation and/or analysis.

ANALYSIS DATE/TIME - the date and military time of the injection of the sample, standard, or blank into the GC/MS or GC system.

BAR GRAPH SPECTRUM - a plot of the mass-to-charge ratio (m/e) versus relative intensity of the ion current.

BLANK - an analytical sample designed to assess specific sources of laboratory contamination. See individual types of Blanks: Method Blank; Instrument Blank, Storage Blank, and Sulfur Blank.

BREAKDOWN - a measure of the decomposition of certain analytes (DDT and Endrin) into by-products.

4-BROMOFLUOROBENZENE (BFB) - the compound chosen to establish mass spectral instrument performance for volatile (VOA) analyses. It is also used in the VOA fraction as a system monitoring compound (SMC).

CALIBRATION FACTOR (CF) - a measure of the gas chromatographic response of a target analyte to the mass injected. The calibration factor is analogous to the Relative Response Factor (RRF) used in the Volatile and Semivolatile fractions.

CASE - a finite, usually predetermined number of samples collected over a given time period from a particular site. Case numbers are assigned by the Sample Management Office. A Case consists of one or more Sample Delivery Groups.

CHARACTERIZATION - a determination of the approximate concentration range of compounds of interest used to choose the appropriate analytical protocol.

CONCENTRATION LEVEL (low or medium) - characterization of soil samples or sample fractions as low concentration or medium concentration is made on the basis of the laboratory's preliminary screen, <u>not</u> on the basis of information entered on the Traffic Report by the sampler.

CONTAMINATION - a component of a sample or an extract that is not representative of the environmental source of the sample. Contamination may stem from other samples, sampling equipment, while in transit, from laboratory reagents, laboratory environment, or analytical instruments.

CONTINUING CALIBRATION - analytical standard run every 12 hours to verify the initial calibration of the system.

CONTINUOUS LIQUID-LIQUID EXTRACTION - used herein synonymously with the terms continuous extraction, continuous liquid extraction, and liquid extraction. This extraction technique involves boiling the extraction solvent in a flask and condensing the solvent above the aqueous sample. The condensed solvent drips through the sample, extracting the compounds of interest from the aqueous phase.

| *(CLASS) CONTRACT LABORATORY ANALYTICAL SERVICES SUPPORT - contract that operates the Sample Management Office (SMO) and is awarded and administered by the EPA.*

DATE -

| *Hardcopy Reporting* - MM/DD/YY - where MM = 01 for January, 02 for February, ... 12 for December; DD = 01 to 31; YY = 96, 97, 98, 99, etc.

| *Electronic Reporting - MM/DD/YYYY - where MM = 01 for January, 02 for February, ... 12 for December; DD = 01 to 31; YYYY = 1996, 1997, 1998, 1999, etc.*

DAY - unless otherwise specified, day shall mean calendar day.

DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP) - compound chosen to establish mass spectral instrument performance for semivolatile analysis.

EXTRACTABLE - a compound that can be partitioned into an organic solvent from the sample matrix and is amenable to gas chromatography. Extractables include semivolatile (BNA) and pesticide/Aroclor compounds.

EXTRACTED ION CURRENT PROFILE (EICP) - a plot of ion abundance versus time (or scan number) for ion(s) of specified mass(es).

| *FIELD* SAMPLE - a portion of material to be analyzed that is contained in single or multiple containers and identified by a unique sample number.

GAS CHROMATOGRAPH (GC) - the instrument used to separate analytes on a stationary phase within a chromatographic column. The analytes are volatized directly from the sample (VOA water and low-soil), volatized from the sample extract (VOA medium soil), or injected as extracts (SVOA and PEST). In VOA and SVOA analysis, the compounds are detected by a Mass Spectrometer (MS). In PEST analysis, the compounds are detected by an Electron Capture (EC) detector. In the screening procedure (all fractions), the Flame Ionization Detector (FID) is used as the detector.

GEL PERMEATION CHROMATOGRAPHY (GPC) - a size-exclusion chromatographic technique that is used as a cleanup procedure for removing large organic molecules, particularly naturally occurring macro-molecules such as lipids, polymers, viruses, etc.

IN-HOUSE - at the Contractor's facility.

INITIAL CALIBRATION - analysis of analytical standards for a series of different specified concentrations; used to define the linearity and dynamic range of the response of the mass spectrometer or electron capture detector to the target compounds.

INTEGRATION SCAN RANGE - the scan number of the scan at the beginning of the area of integration to the scan number at the end of the area of integration. Performed in accordance with Exhibit D VOA, Sections 11.2.1.9 and 11.2.1.10 and Exhibit D SVOA, Sections 11.2.1.2 and 11.2.1.3.

INTEGRATION TIME RANGE - the retention time at the beginning of the area of integration to the retention time at the end of the area of integration.

INTERNAL STANDARDS - compounds added to every standard, blank, matrix spike, matrix spike duplicate, sample (for volatiles), and sample extract (for semivolatiles) at a known concentration, prior to analysis. Internal standards are used as the basis for quantitation of the target compounds.

INSTRUMENT BLANK - a blank designed to determine the level of contamination associated with the analytical instruments.

INSUFFICIENT QUANTITY - when there is not enough volume (water sample) or weight (soil/sediment) to perform any of the required operations: sample analysis or extraction, percent moisture, MS/MSD, etc. Exhibit D provides guidance for addressing this situation.

LABORATORY - synonymous with Contractor as used herein.

m/z - Mass to charge ratio, synonymous with "m/e".

MATRIX - the predominant material of which the sample to be analyzed is composed. For the purpose of this SOW, a sample matrix is either water or soil/sediment. Matrix is <u>not</u> synonymous with phase (liquid or solid).

MATRIX EFFECT - in general, the effect of a particular matrix (water or soil/sediment) on the constituents with which it contacts. This is particularly pronounced for clay particles which may adsorb chemicals and catalyze reactions. Matrix effects may prevent extraction of target analytes, and may affect surrogate recoveries. In addition, non-target analytes may be extracted from the matrix causing interferences.

MATRIX SPIKE - aliquot of a matrix (water or soil) fortified (spiked) with known quantities of specific compounds and subjected to the entire analytical procedure in order to indicate the appropriateness of the method for the matrix by measuring recovery.

MATRIX SPIKE DUPLICATE - a second aliquot of the same matrix as the matrix spike (above) that is spiked in order to determine the precision of the method.

METHOD BLANK - an analytical control consisting of all reagents, internal standards, and surrogate standards (or SMCs for VOA), that is carried throughout the entire analytical procedure. The method blank is used to define the level of laboratory, background, and reagent contamination.

NARRATIVE (SDG Narrative) - portion of the data package which includes laboratory, contract, Case, and sample number identification, and descriptive documentation of any problems encountered in processing the samples, along with corrective action taken and problem resolution. Complete SDG Narrative specifications are included in Exhibit B.

PERCENT DIFFERENCE (%D) - As used in this SOW and elsewhere to compare two values, the percent difference indicates both the direction and the magnitude of the comparison, i.e., the percent difference may be either negative, positive, or zero. (In contrast, see relative percent difference.)

PERCENT MOISTURE - an approximation of the amount of water in a soil/sediment sample made by drying an aliquot of the sample at 105 °C. The percent moisture determined in this manner also includes contributions from all compounds that may volatilize at or below 105 °C, including water. Percent moisture may be determined from decanted samples and from samples that are not decanted.

PERFORMANCE EVALUATION MIXTURE - a calibration solution of specific analytes used to evaluate both recovery and percent breakdown as measures of performance.

PRIMARY QUANTITATION ION - a contract specified ion used to quantitate a target analyte.

PROTOCOL - describes the exact procedures to be followed with respect to sample receipt and handling, analytical methods, data reporting and deliverables, and document control. Used synonymously with Statement of Work (SOW).

PURGE AND TRAP (DEVICE) - analytical technique (device) used to isolate volatile (purgeable) organics by stripping the compounds from water or soil by a stream of inert gas, trapping the compounds on an adsorbent such as a porous polymer trap, and thermally desorbing the trapped compounds onto the gas chromatographic column.

PURGEABLES - volatile compounds.

| *QUALITY ASSURANCE TECHNICAL SUPPORT (QATS) LABORATORY - a contractor operated*
| *facility operated under the QATS contract, awarded and administered by the*
| *EPA.*

REAGENT WATER - water in which an interferant is not observed at or above the minimum quantitation limit of the parameters of interest.

RECONSTRUCTED ION CHROMATOGRAM (RIC) - a mass spectral graphical representation of the separation achieved by a gas chromatograph; a plot of total ion current versus retention time.

RELATIVE PERCENT DIFFERENCE (RPD) - As used in this SOW and elsewhere to compare two values, the relative percent difference is based on the mean of the two values, and is reported as an absolute value, i.e., always expressed as a positive number or zero. In contrast, see percent difference.

RELATIVE RESPONSE FACTOR (RRF) - a measure of the relative mass spectral response of an analyte compared to its internal standard. Relative Response Factors are determined by analysis of standards and are used in the calculation of concentrations of analytes in samples. RRF is determined by the following equation:

$$RRF = \frac{A_x}{A_{is}} \times \frac{C_{is}}{C_x}$$

Where,

A = area of the characteristic ion measured
C = concentration, or amount (mass)
is = internal standard
x = analyte of interest

RELATIVE RETENTION TIME (RRT) - the ratio of the retention time of a compound to that of a standard (such as an internal standard).

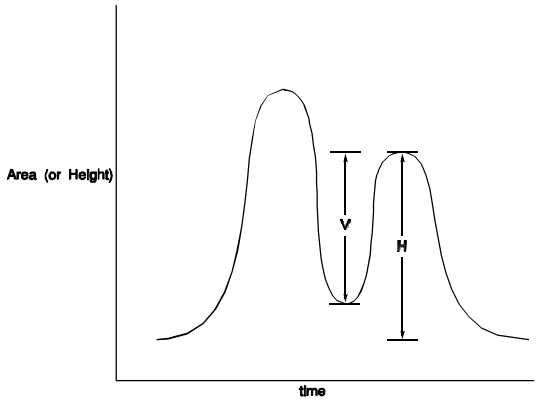
$$RRT = \frac{RT_c}{RT_{is}}$$

Where,

RT_c = Retention time for the semivolatile target or surrogate compound in continuing calibration.
RT_{is}= Retention time for the internal standard in calibration standard or in a sample.

| *REPRESENTATIVE - alternate or designee who has the knowledge and authority to*
| *perform a specific task.*

RESOLUTION - also termed separation or percent resolution, the separation between peaks on a chromatogram, calculated by dividing the depth of the valley between the peaks by the peak height of the smaller peak being resolved, multiplied by 100.



For pesticide analysis the X-axis shall be displayed such that a data reviewer can calculate the % Resolution.

RESOLUTION CHECK MIXTURE - a solution of specific analytes used to determine resolution of adjacent peaks; used to assess instrumental performance.

RESPONSE - or Instrumental Response: a measurement of the output of the GC detector (MS, EC, or FID) in which the intensity of the signal is proportionate to the amount (or concentration) detected. Measured by peak area or peak height.

RETENTION TIME (RT) - the time a target analyte is retained on a GC column before elution. The identification of a target analyte is dependent on a target compound's retention time falling within the specified retention time window established for that compound. Retention time is dependent on the nature of the column's stationary phase, column diameter, temperature, flow rate, and other parameters.

SAMPLE DELIVERY GROUP (SDG) - a unit within a single Case that is used to identify a group of samples for delivery. An SDG is a group of 20 or fewer | field samples within a Case, received over a period of up to *7* calendar days. Data from all samples in an SDG are due concurrently. A Sample Delivery Group is defined by one of the following, whichever occurs first:

- All samples within a Case; or

| - Every set of 20 field samples *(excluding PE samples)* within a Case; or

| - All samples received within *7 calendar days, excluding Sundays and Government holidays. However, PE samples received within a Case shall be assigned to an SDG containing field samples for the Case.*

| *In addition, all samples and sample fractions assigned to an SDG must have* | *been scheduled under the same contractual turnaround time.*

Samples may be assigned to Sample Delivery Groups by matrix (i.e., all soil samples in one SDG, all water samples in another), at the discretion of the laboratory.

| *SAMPLE MANAGEMENT OFFICE (SMO) - a contractor operated facility operated by* | *the CLASS contract, awarded and administered by the EPA.*

SAMPLE NUMBER (EPA Sample Number) - a unique identification number designated by EPA to each sample. The EPA sample number appears on the sample Traffic Report which documents information on that sample.

SECONDARY QUANTITATION ION - contract specified ion(s) to be used in quantitation of target analytes when interferences prevent the use of the primary quantitation ion.

SEMIVOLATILE COMPOUNDS - compounds amenable to analysis by extraction of the sample with an organic solvent. Used synonymously with Base/Neutral/Acid (BNA) compounds.

SOIL - used herein synonymously with soil/sediment and sediment.

SONIC CELL DISRUPTOR (SONICATOR) - a device that uses the energy from controlled ultrasound applications to mix, disperse, and dissolve organic materials from a given matrix.

STANDARD ANALYSIS - an analytical determination made with known quantities of target compounds; used to determine response factors.

STORAGE BLANK - reagent water (two 40.0 mL aliquots) stored with samples in an SDG. It is analyzed after all samples in that SDG have been analyzed; and is used to determine the level of contamination acquired during storage.

SULFUR BLANK - a modified method blank that is prepared only when some of the samples in a batch are subjected to sulfur cleanup. It is used to determine the level of contamination associated with the sulfur cleanup procedure. When all of the samples are subjected to sulfur cleanup, then the method blank serves this purpose. When none of the samples are subjected to sulfur cleanup, no sulfur blank is required.

SURROGATES (Surrogate Standard) - for semivolatiles and pesticides/Aroclors, compounds added to every blank, sample, matrix spike, matrix spike duplicate, and standard; used to evaluate analytical efficiency by measuring recovery. Surrogates are brominated, fluorinated, or isotopically labeled compounds not expected to be detected in environmental media.

SYSTEM MONITORING COMPOUNDS - compounds added to every blank, sample, matrix spike, matrix spike duplicate, and standard for volatile analysis, and used to evaluate the performance of the entire purge and trap-gas chromatograph-mass spectrometer system. These compounds are brominated or deuterated compounds not expected to be detected in environmental media.

TARGET COMPOUND LIST (TCL) - a list of compounds designated by the Statement of Work (Exhibit C) for analysis.

TENTATIVELY IDENTIFIED COMPOUNDS (TIC) - compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates. *TICs must have peak areas or heights* greater than 10% of the peak areas or heights of nearest internal standard*. TICs must be* subjected to mass spectral library searches *and be deemed acceptable by a mass spectral interpretation specialist*.

TIME - when required to record time on any deliverable item, time shall be expressed as Military Time, i.e., a 24-hour clock.

TRAFFIC REPORT (TR) - an EPA sample identification form filled out by the sampler, which accompanies the sample during shipment to the laboratory and which documents sample condition and receipt by the laboratory.

TWELVE-HOUR TIME PERIOD - The twelve (12) hour time period for GC/MS system instrument performance check, standards calibration (initial or continuing calibration), and method blank analysis begins at the moment of injection of the DFTPP or BFB analysis that the laboratory submits as documentation of instrument performance. The time period ends after 12 hours have elapsed according to the system clock. For pesticide/Aroclor analyses performed by GC/EC, the twelve hour time period in the analytical sequence begins at the moment of injection of the instrument blank that precedes sample analyses, and ends after twelve hours have elapsed according to the system clock.

VALIDATED TIME OF SAMPLE RECEIPT (VTSR) - the date on which a sample is received at the Contractor's facility, as recorded on the shipper's delivery receipt and Sample Traffic Report.

VOLATILE COMPOUNDS - compounds amenable to analysis by the purge and trap technique. Used synonymously with purgeable compounds.

WIDE BORE CAPILLARY COLUMN - a gas chromatographic column with an internal diameter (ID) that is greater than or equal to 0.53 mm. Columns with lesser diameters are classified as narrow bore capillary columns.

EXHIBIT H

AGENCY STANDARD IMPLEMENTATION

Exhibit H - Agency Standard Implementation

Table of Contents

1.0 FORMAT CHARACTERISTICS

1.1 This constitutes an implementation of the EPA Agency Standard for Electronic Data Transmission based upon analytical results and ancillary information required by the contract. All data generated by a single analysis are grouped together, and the groups are aggregated to produce files that report data from an SDG. Because this implementation is only a subset of the Agency Standard, some fields have been replaced by delimiters as place holders for non-CLP data elements.

1.2 This implementation includes detailed specifications for the required format of each record. The position in the record where each field is to be contained relevant to other fields is specified, as well as the maximum length of the field. Each field's required contents are specified as literal (contained in quotes), which must appear exactly as shown (without quotes), or as a variable for which format and/or descriptions are listed in the format/contents column. Options and examples are listed for most fields. For fields where more than three options are available, a list and description of options are supplied on a separate page following the record descriptions. Fields are separated from each other by the delimiter "|" (ASCII 124). Fields that do not contain data should be zero length or a blank field (empty with no space or additional delimiters between the delimiters before and after the field) with the delimiter as a place holder. For the purposes of Section 9 of this exhibit, wherever "blank" is given as an option under the "Format/Contents" column, it refers to a blank field as explained above.

1.3 Numeric fields may contain numeric digits, a decimal place, and a leading minus sign. A positive sign is assumed if no negative sign is entered in a numeric field and shall not be entered into any numeric field. Values that exceed the maximum length allowed shall be reported to the maximum possible, maintaining the specified decimal place and maximum field length restrictions.

1.4 Requirements for significant figures and number of decimal places are specified in Exhibit B. The numeric field lengths are specified such that all possible numeric values can be written to the file. The size of the numeric field indicates the maximum number of digits, including a decimal place and negative sign (if appropriate), that can appear in the field at the same time. Therefore, the number reported may need to be rounded (using rounding rules described in Exhibit B) to fit into the field. The rounding shall maintain the greatest significance possible providing the field length limitation. In addition, the rounded number that appears on the form, and therefore in the field on the diskette file, must be used in any calculation that may result in other numbers reported on the same form or other forms in the SDG. The numbers/values reported by the Contractor are used by CCS to calculate a result (e.g., CRQL). The final value calculated by CCS is then rounded according to rounding rules described in Exhibit B and is used for comparison to the final value (e.g., CRQL) reported by the Contractor. Field lengths should only be as long as necessary to contain the data; packing with blanks is not allowed.

1.5 The CLP is currently developing a data delivery strategy that may be used as an alternative to the requirements stated in Exhibit H. This strategy's intent is to provide a neutral data delivery structure to the Contractor that will further facilitate the exchange of analytical information generated under this analytical protocol. The proposed strategy is intended to accommodate laboratories that generate data transmission files under multiple data formats. Upon implementation of this alternate electronic data delivery strategy by the CLP and prior to submission of data in alternate format(s), the Contractor must first demonstrate its ability to provide electronic data as stated in this Exhibit H and obtain written permission from the CLP for the submission of data in alternate format(s). The Contractor will receive a written response to its request within 90 calendar days. However, until the implementation of this alternate electronic data delivery strategy by the CLP, all electronic data deliverables must be provided as specified in this Exhibit H.

2.0 RECORD TYPES

2.1 The Agency Standard consists of variable length ASCII records. Maximum field length specifications match the reporting requirements in Exhibit B. The last two bytes of each record shall contain "carriage return" and "line feed", respectively.

2.2 This implementation consists of twelve record types that can be summarized in four groups, designated by the first record type in each group:

Type	Type ID	Contents
Run Header	10	Information pertinent to a group of samples processed in a continuous sequence; usually several per SDG
Sample Header	20	Sample identifying, qualifying, and linking information
Results Record	30	Analyte results and qualifications
Comments Record	90	Free form comments

2.3 A separate run header is used for volatiles (VOA), semivolatiles (SV), and for each column analysis for pesticides (PEST) (minimum of four type 10 series for VOA/SV/PEST SDG). The 20 series records contain sample characteristics and link samples within an SDG to the corresponding calibrations, blanks, and other QCs. The 30 series records contain the actual analytical results by analyte within each sample. The 10, 20, and 30 records are associated with each other by their position in the file (i.e., 30 series records follow the corresponding 20 series, which in turn follow the 10 series run header records).

3.0 PRODUCTION RUNS

3.1 A production run represents a "group" or "batch" of samples that are processed in a continuous sequence under relatively stable conditions. Specifically:

3.1.1 Calibration - All samples in a run use the same initial calibration data.

3.1.2 Method number - Constant throughout a run.

3.1.3 Instrument conditions - Constant throughout a run.

3.2 Each instrumental analysis consists of a separate production run and is reported in a separate file. There will be a separate production run for each of the two pesticide GC columns utilized. Thus, a full three fraction analysis will consist of a minimum of four production runs.

3.3 Example of the Sequence of Record Types in a File[1]

```
10              Contains Run Header information.
    11          Contains additional run-wide information.
    20          Occurs once for each sample, calibration, mean response
                factor, matrix spike duplicate result, etc.  Acts as a
                header.
    21
    22          Contains additional information for samples.
    23
    27
        30      Occurs once for each final analytical result.  Reports
                the value being determined as defined by the type 20.
            32  Reports any auxiliary data necessary.
            33  Reports compound names for tentatively identified
                compounds (TICs) if necessary.
            36  Reports any instrumental data necessary.
        30      Values for the next analyte or parameter being measured.
            32  Additional data may vary for each parameter, and may
            33  occur in any order.  Multiple occurrences of the same
            36  record type, however, must be consecutive.
        30      Continues for as many as are necessary.
            32
            33
            36
        30
            32
            33
            36
    20          Next Sample Header record.  The following applies to the
    21          next sample or other group of data.
    22
        30
            32
            33
            36
        30
            32
            33
            36
                etc.
    20
    21
        30
            32
            33
            36
                etc.
```

1 Appendix A provides a detailed set of examples for the use of the different record types, and their relationship to other record types.

4.0 RECORD SEQUENCE

4.1 The sequence of records for Agency Standard files is as follows: A Run Header (type 10) record shall be present once and once only (per file) as the first record in a file. Therefore, a complete VOA/SV/PEST SDG will consist of several files.

4.2 Each environmental sample, calibration standard, or quality control sample is represented by a group composed of type 20, 21, 22, 23, and 27 records, that hold sample level identifying information, followed by type 30, 32, 33, and 36 records for each method analyte including surrogates, system monitoring compounds, and internal standards in the sample. The type 20 record holds a count for the number of method analytes being determined and includes all target compounds, surrogates, system monitoring compounds, and internal standards plus each peak of the multi-component pesticides (do not include TICs in this count). A separate field on the type 23 record contains the number of TICs found. Type 20 records shall occur in the order of sample analysis. In addition, a type 20 record with a QC code "MNC", followed by a type 30 record for each method analyte (reporting values such as mean response factors) will appear after the type 10 or type 11 record and before the type 20 record that initiates the analytical sequence. Similarly, for pesticide runs, a type 20 record with a QC code "GPC" for GPC recovery, followed by type 30 records for each of the method analytes spiked; and a type 20 record with a QC code "FLO" for Florisil recovery, followed by type 30 records for each of the method analytes (and the two surrogates) included in the Florisil check will appear before the type 20 record that initiates the analytical sequence.

4.3 Type 90 comment records may be defined to occupy any position after the type 10 (header) record.

5.0 FILE/RECORD INTEGRITY

All record types shall contain the following check fields to ensure file and record integrity:

Record Position	Field Length	Field Contents	Remarks
First Field	2	Record type	"10" or as appropriate
Last Field	5	Record sequence number	00001-99999, numbered within file sequentially
	4	Record checksum[1]	Four hexadecimal digits
	2	Must contain CR and LF	

6.0 DATES AND TIMES

Date or time-of-day information consists of successive groups of two decimal digits *(except year, which is four decimal digits)*, each separated by delimiters. Dates are given in the order *YYYY* MM DD, and times as HH MM. All hours shall be given as 00 to 23 using a 24-hour clock and shall be local time. All days shall be given as 01 to 31. All months shall be given as 01 to 12 (e.g., 01 is January, 02 is February).

7.0 MULTIPLE VOLUME DATA

There is no requirement under this format that all the data from an entire sample delivery group fit onto a single diskette. However, each single production run must fit onto a single diskette if possible. If that is not possible, then it is necessary that all files start with a type 10 record, and that the multiple type 10 records for each file of the same production run be identical. Information for a single sample shall not be split between files.

---

1 The checksum is the sum of the ASCII representation of the data on the record up to the Record Sequence Number (not including the Record Sequence Number) plus the checksum of the previous record. The sum is taken modulo 65536 (2^{16}) and is represented as four hexadecimal digits (i.e., the remainder of the sum divided by 65536 represented as four hexadecimal digits).

8.0 DELIVERABLE

| *8.1* The file shall be submitted on IBM-compatible, 3.5 inch high density 1.44 M-byte diskettes. The diskettes shall be formatted and recorded using MS-DOS Operating System. The diskettes shall contain all
| information relevant to one and only one SDG. *An alternative means of*
| *electronic transmission may be utilized if approved in advance by the*
| *EPA.*

8.2 Agency Standard data from an entire SDG may not fit onto a single diskette. If a single production run is being split onto multiple diskettes, then all files shall start with a type 10 record, and the multiple type 10 records for each file of the same production run shall be identical. Do not split the data from a single sample onto multiple diskettes.

8.3 Information on the diskette **must correspond** to information submitted in the hardcopy raw data package and on the hardcopy raw data package forms. For example, type 30 results field specifies maximum length of 13. When reporting CRQLs or results on Form 1, maximum length is 13 as is specified in this exhibit; when reporting 'calculated amounts' on Form 7D, hardcopy specified maximum length is 8. Unused records shall not be included on the diskettes. If the information submitted in the hardcopy data package forms is changed, the information in the
| *electronic file (e.g., diskette)* shall be changed accordingly, and a
| complete *electronic deliverable* containing all the information for the SDG shall be resubmitted along with the hardcopy at no additional cost to the EPA.

8.4 Each diskette shall be identified with an external label containing (in this order) the following information:

Disk Density
File Name(s)
Laboratory Name (optional)
Laboratory Code
Contract Number
Case Number/SDG
SAS Number (where applicable)
Initial Submission or Resubmission (as applicable) and Date

8.5 The format for File Name shall be XXXXX.O01 to XXXXX.O99. Where XXXXX is the SDG identifier, O designates Organics, and 01 through 99 is the file number.

8.6 Dimensions of the label must be in the range of 2-1/2" to 2-3/4" long by 2" to 2-1/8" wide for a 3-1/2 inch IBM-compatible diskette.

8.7 Section 9.0 (Record Listing) provides information for the usage of each of the record types. Where specified, labels indicate the nature of the value(s) that follow on that record. If the value(s) will not be reported, the label shall be omitted.

8.7.1 A record type 30 for each TCL compound, surrogate, system monitoring compound, and internal standard quantitated for shall be reported. If the TCL is not detected, the 'U' qualifier in the appropriate field shall be indicative of that.

8.7.2 For multicomponent analytes (Aroclors/toxaphene), if the multicomponent analyte is detected, a record type 30 and 32 shall be reported for each peak identified.

9.0 RECORD LISTING

The following lists every record type required to report data from a single SDG.

9.1 Production Run Header Record (Type 10)

Use: Each production run will start with a record type 10.

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
2	RECORD TYPE	"10"
6	Delimiters	||||||
5	INSTRUMENT/DETECTOR	Character[1]
1	Delimiter	|
8	METHOD NUMBER	Character[2]
2	Delimiters	||
6	LAB CODE	Character
4	Delimiters	||||
11	CONTRACT NUMBER	Character
1	Delimiter	|
10	INSTRUMENT ID	Character
2	Delimiters	||
25	LABORATORY NAME	Character
2	Delimiters	||
5	RECORD SEQUENCE NUMBER	Numeric
4	CHECKSUM	Character

---

1 General descriptor (GC/MS for VOA/SVOA analysis or GC for pesticide analysis on GC/EC).

| 2 *OLM04.2V* For Volatiles; *OLM04.2B* for semivolatiles; *OLM04.2P* for pesticides. (O for Organic, L for Low, M for Medium, zero *four* for document number, zero V for volatiles, zero B for semivolatiles, zero P for pesticides.)

9.2 Chromatography Record (Type 11)

Use: To describe chromatograph condition. Must be present once for each production run immediately following the record type 10.

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
2	RECORD TYPE	"11"
1	Delimiter	|
10	GC COLUMN IDENTIFICATION	Character
2	Delimiters	||
4	GC COLUMN ID[1]	Numeric (mm)
11	Delimiters	|||||||||||
5	RECORD SEQUENCE NO.	Numeric
4	CHECKSUM	Character

1 Internal Diameter of the GC column used.

9.3 Sample Header Data Record (Type 20)

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
2	RECORD TYPE	"20"
2	Delimiters	||
12	EPA SAMPLE NUMBER	As is exactly on the hardcopy form
1	Delimiter	|
1	MATRIX	CHARACTER[1]
1	Delimiter	|
3	QC CODE	Character (See Section 10)
1	Delimiter	|
3	SAMPLE QUALIFIER	RIN/REX/REJ/SRN/blank[2]
1	Delimiter	|
5	CASE NUMBER	Numeric
1	Delimiter	|
6	SDG NO.	Character
1	Delimiter	|
4	SAMPLE/BLANK/STANDARDS YEAR ANALYZED	*YYYY*
1	Delimiter	|
2	SAMPLE/BLANK/STANDARDS MONTH ANALYZED	MM
1	Delimiter	|
2	SAMPLE/BLANK/STANDARDS DAY ANALYZED	DD
1	Delimiter	|
2	SAMPLE/BLANK/STANDARDS HOUR ANALYZED	HH
1	Delimiter	|
2	SAMPLE/BLANK/STANDARDS MINUTE ANALYZED	MM
2	Delimiters	||
2	SAMPLE WT/VOL UNITS	"G"/"ML"/blank[3]
1	Delimiter	|
5	SAMPLE WT/VOL	Numeric[4]

---

1 "0" if not applicable (calibration, tune, etc.); "1" for water; "H" for soil.

2 "RIN" for reinjection; "REX" for re-extractions; "REJ" for rejected samples; "SRN" for dilutions; and leave blank (empty field with zero length) when none of the previous conditions apply. In case of multiple operations on a sample, the final operation will be indicated (e.g., reinjection of a dilution; AAA12DLRE would have a QC Code of "RIN").

3 Sample WT/VOL unit is mL (milliliters) for liquids and G (grams) for solids. The sample units code indicates which units are in use for the current sample. Leave blank (zero length) if not applicable.

4 Sample WT/VOL is the volume in milliliters for liquid or the wet weight in grams for solids. Sample WT/VOL includes the purge volume.

Sample Header Data Record (Type 20) (Cont.)

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
1	Delimiter	|
3	ANALYTE COUNT	Numeric[5]
3	Delimiters	|||
5	RECORD SEQUENCE NO.	Numeric
4	CHECKSUM	Character

5 1-3 decimal digits. Counts TCL analytes, surrogates, system monitoring compounds (SMC), internal standards, and all peaks reported for multi-component PCBs. Do not include the count for TICs in this field. For calibrations, also count DFTPP, if included in calibration solution.

9.4 Sample Header Data Record (Type 21)

Use: Continuation of Type 20.
Position: Follows the Type 20 to which it applies.

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
2	RECORD TYPE	"21"
1	Delimiter	|
1	PURGE	"N" for not heated; "Y" for heated; blank if SV or PEST
1	Delimiter	|
1	LEVEL	"L"/"M"/blank[1]
2	Delimiters	||
1	EXTRACTION	S/C/*H*/N/*X/P/T/*blank (for *all other* volatile *samples*)[2]
2	Delimiters	||
6	SAS NUMBER	Character
1	Delimiter	|
14	LAB FILE/SAMPLE ID	Character[3]
1	Delimiter	|
4	YEAR EXTRACTED	*YY*YY/blank (for volatiles)
1	Delimiter	|
2	MONTH EXTRACTED	MM/blank (for volatiles)
1	Delimiter	|
2	DAY EXTRACTED	DD/blank (for volatiles)
2	Delimiters	||
4	YEAR RECEIVED	*YY*YY/blank (for standards, tunes, and blanks)
1	Delimiter	|
2	MONTH RECEIVED	MM/blank (for standards, tunes, and blanks)
1	Delimiter	|
2	DAY RECEIVED	DD/blank (for standards, tunes, and blanks)
2	Delimiters	||

---

1 "L" for low level samples and "M" for medium level samples for volatile and semivolatile analyses. Leave blank for pesticides, all calibrations, and all tunes.

2 "S" for separatory funnel; "C" for continuous liq-liq *without hydrophobic membrane; "H" for continuous liq-liq with hydrophobic membrane*; "N" for sonication; *"X" for automated soxhlet; "P" for pressurized fluid; "T" for volatile low level soils by the Modified SW-846 Method 5035;* blank (zero length field) for *all other* volatile *samples*.

3 Lab File ID for volatile and semivolatile analyses. Lab Sample ID for pesticides in same format as on forms.

Sample Header Data Record (Type 21) (Cont.)

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
8	INJECTION/ALIQUOT VOLUME	Numeric/blank (for low level VOA)[4]
2	Delimiters	||
5	RECORD SEQUENCE NO.	Numeric
4	CHECKSUM	Character

4 Injection volume, in uL, for SVOAs and PESTs; Soil Aliquot Volume for medium level VOA.

9.5 Sample Condition Record (Type 22)

Use: Continuation of type 20. Used to describe additional Sample Conditions.
Position: Follows the type 20 and 21 to which it applies.

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
2	RECORD TYPE	"22"
1	Delimiter	|
4	CALIBRATION YEAR	*YYYY*/blank (for PEST)[1]
1	Delimiter	|
2	CALIBRATION MONTH	MM/blank (for PEST)
1	Delimiter	|
2	CALIBRATION DAY	DD/blank (for PEST)
1	Delimiter	|
2	CALIBRATION HOUR	HH/blank (for PEST)
1	Delimiter	|
2	CALIBRATION MINUTE	MM/blank (for PEST)
1	Delimiter	|
14	CALIBRATION FILE ID	Character/blank (for PEST)[2]
1	Delimiter	|
4	PH	Numeric/blank (for aqueous samples and volatiles)
1	Delimiter	|
5	PERCENT MOISTURE	Numeric
1	Delimiter	|
1	DECANTED	"Y"/"N"/blank (for volatiles)
1	Delimiter	|
8	EXTRACT VOLUME	Numeric/blank (for low level VOA)[3]
1	Delimiter	|
8	DILUTION FACTOR	Numeric[4]
3	Delimiters	|||

---

1 For volatiles and semivolatiles, enter the date and time of analysis of the most recent 50 ug/L (VOAs) or the 50 ng (SVOAs) standard run prior to the sample reported in the associated type 20 record. Leave blank for pesticides.

2 Lab File ID of standard specified in 1 above (volatiles/semivolatiles only). This field must match the Lab File ID on Type 21 for the associated calibration (VSTD050/SSTD050). Leave blank for pesticides.

3 Enter the Soil Extract Volume for medium level VOA, and Concentrated Extract Volume for all SVOA and PEST. The value should be reported in microliters.

4 Dilution factor of sample analyzed (omit contract-mandated dilutions).

Sample Condition Record (Type 22) (Cont.)

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
5	LEVEL	Numeric/blank (for VOA/SV)[5]
1	Delimiter	|
5	RECORD SEQUENCE NO.	Numeric
4	CHECKSUM	Character

5 Concentration level of Pesticide Individual Mix A and B standards. Concentration of low point, mid point and high point calibration standards as a multiplier of low point. Low point = 1.0; Mid point = 4.0; High point ≥ 16.0.

9.6 Associated Injection and Counter Record (Type 23)

Use: Continuation of type 20. Used to identify associated blanks and tunes, and the number of surrogates/SMCs and spikes outside of the QC limits and the number of TICs.

Position: Follows the type 20, 21, and 22 to which it applies.

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
2	RECORD TYPE	"23"
1	Delimiter	|
1	INSTRUMENT PERFORMANCE CHECK (IPC/TUNE) LABEL	"P" (for BFB and DFTPP IPC) or blank (for pesticides)
1	Delimiter	|
4	IPC/TUNE INJECTION YEAR	*YY*YY/blank (for PEST)
1	Delimiter	|
2	IPC/TUNE INJECTION MONTH	MM/blank (for PEST)
1	Delimiter	|
2	IPC/TUNE INJECTION DAY	DD/blank (for PEST)
1	Delimiter	|
2	IPC/TUNE INJECTION HOUR	HH/blank (for PEST)
1	Delimiter	|
2	IPC/TUNE INJECTION MINUTE	MM/blank (for PEST)
1	Delimiter	|
14	DFTPP/BFB LAB FILE ID	Character/blank (for PEST)
1	Delimiter	|
2	VOLATILE STORAGE BLANK LABEL	"HB" (for VOA) or blank (for SV and PEST)
1	Delimiter	|
4	STORAGE BLANK INJECTION YEAR	*YY*YY/blank (for SV and PEST)
1	Delimiter	|
2	STORAGE BLANK INJECTION MONTH	MM/blank (for SV and PEST)
1	Delimiter	|
2	STORAGE BLANK INJECTION DAY	DD/blank (for SV and PEST)
1	Delimiter	|
2	STORAGE BLANK INJECTION HOUR	HH/blank (for SV and PEST)
1	Delimiter	|
2	STORAGE BLANK INJECTION MINUTE	MM/blank (for SV and PEST)
1	Delimiter	|
14	STORAGE BLANK LAB FILE ID (VOA ONLY)	Character
4	Delimiters	||||

Associated Injection and Counter Record (Type 23) (Cont.)

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
2	METHOD BLANK LABEL	"MB"/blank (for standard, tune, and method blanks)
1	Delimiter	|
4	METHOD BLANK INJECTION YEAR	*YYYY*/blank (for standard, tune, and method blanks)
1	Delimiter	|
2	METHOD BLANK INJECTION MONTH	MM/blank (for standard, tune, and method blanks)
1	Delimiter	|
2	METHOD BLANK INJECTION DAY	DD/blank (for standard, tune, and method blanks)
1	Delimiter	|
2	METHOD BLANK INJECTION HOUR	HH/blank (for standard, tune, and method blanks)
1	Delimiter	|
2	METHOD BLANK INJECTION MINUTES	MM/blank (for standard, tune, and method blanks)
1	Delimiter	|
14	METHOD BLANK LAB FILE (for VOA and SV)/SAMPLE ID (for PEST)	CHARACTER
1	Delimiter	|
1	SURROGATE (for SV and PEST)/SMC (for VOA) RECOVERY LABEL	"P" for % recoveries/blank (for STD/IPC)
1	Delimiter	|
2	SURROGATE (for SV and PEST)/SMC (for VOA) RECOVERIES OUT	Numeric[1]
1	Delimiter	|
1	TIC LABEL	"T" (for VOA and SV TICs)/blank (for PEST)
1	Delimiter	|
2	NO. OF TICS	Numeric
1	Delimiter	|
1	SPIKE RECOVERY LABEL	"S" for Matrix Spikes and Matrix Spike Duplicates/blank for anything else
1	Delimiter	|

1 This will be the number of surrogate (for SV or PEST) or SMC (for VOA) recoveries outside QC limits for a specific column. It should not be cumulative of the two columns for pesticides.

Associated Injection and Counter Record (Type 23) (Cont.)

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
2	SPIKE RECOVERIES OUT	Numeric/blank[2]
1	Delimiter	|
1	RPD LABEL	"R" for RPD/blank[3]
1	Delimiter	|
2	RPD OUT	Numeric
1	Delimiter	|
5	RECORD SEQUENCE NO.	Numeric
4	CHECKSUM	Character

2 Enter the number of spike recoveries out. Enter "0"(zero) if none of the spike recoveries are outside of the QC limit.

3 "R" for Matrix Spike/Matrix Spike Duplicate Recovery Relative Percent Differences. Leave blank for all other samples (only report for MS/MSD).

9.7 Sample Cleanup Record (Type 27)

Use: Continuation of type 20. Used to identify sample/blank cleanup procedures and QC results.
Position: Follows type 20, 21, 22, and 23 to which it applies.

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
2	RECORD TYPE	"27"
1	Delimiter	|
1	FIRST CLEANUP TYPE	"G" for GPC/blank (for VOA)[1]
1	Delimiter	|
4	GPC CALIBRATION CHECK YEAR	*YYYY*/blank (for VOA)
1	Delimiter	|
2	GPC CALIBRATION CHECK MONTH	MM/blank (for VOA)
1	Delimiter	|
2	GPC CALIBRATION CHECK DAY	DD/blank (for VOA)
1	Delimiter	|
2	GPC CALIBRATION CHECK HOUR	HH/blank (for VOA)
1	Delimiter	|
2	GPC CALIBRATION CHECK MINUTE	MM/blank (for VOA)
1	Delimiter	|
14	GPC Data Descriptor	Character/blank (for VOA and SV)[2]
1	Delimiter	|
1	FLORISIL CLEANUP TYPE	"F" (for PEST) or blank (for VOA and SV)
1	Delimiter	|
4	FLORISIL LOT CHECK YEAR	*YYYY*/blank (for VOA and SV)
1	Delimiter	|
2	FLORISIL LOT CHECK MONTH	MM/blank (for VOA and SV)
1	Delimiter	|
2	FLORISIL LOT CHECK DAY	DD/blank (for VOA and SV)
1	Delimiter	|
2	FLORISIL LOT CHECK HOUR	HH/blank (for VOA and SV)
1	Delimiter	|
2	FLORISIL LOT CHECK MINUTE	MM/blank (for VOA and SV)
1	Delimiter	|
14	FLORISIL DATA DESCRIPTOR	Character[3]

1 "G" indicates that GPC was performed. If GPC was not performed, leave the field blank.

2 Lab Sample ID of associated GPC. This is a unique identifier assigned to the spike recovery results for a specific GPC calibration check for pesticides. Leave blank for volatiles and semivolatiles.

3 Lab Sample ID of associate Florisil lot check. This is a unique identifier assigned to a lot of Florisil cartridges.

Sample Cleanup Record (Type 27) (Cont.)

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
1	Delimiter	|
1	SULFUR CLEANUP	Y/N (for PEST)/blank (for VOA and SV)
1	Delimiter	|
2	SULFUR BLANK LABEL	"SB"/blank (if no separate sulfur blank was prepared for pesticides; also blank for VOA and SV)
1	Delimiter	|
4	SULFUR BLANK INJECTION YEAR	*YYYY*/blank (for VOA and SV)
1	Delimiter	|
2	SULFUR BLANK INJECTION MONTH	MM/blank (for VOA and SV)
2	Delimiters	||
2	SULFUR BLANK INJECTION DAY	DD/blank (for VOA and SV)
1	Delimiter	|
2	SULFUR BLANK INJECTION HOUR	HH/blank (for VOA and SV)
1	Delimiter	|
2	SULFUR BLANK INJECTION MINUTE	MM/blank (for VOA and SV)
1	Delimiter	|
14	SULFUR BLANK LABORATORY/ SAMPLE ID	Character
1	Delimiter	|
5	RECORD SEQUENCE NO.	Numeric
4	CHECKSUM	Character

9.8 Results Data Record (Type 30)

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
2	RECORD TYPE	"30"
1	Delimiter	|
1	ANALYTE LABEL	"C" for CAS Number (blank for unknown TICs)
1	Delimiter	|
9	CAS NUMBER	Numeric (for TCL, surrogates, DFTPP, BFB, SMC, internal standards, and identified TICs)
1	Delimiter	|
9	INTERNAL STD. CAS NUMBER	Numeric
1	Delimiter	|
5	CONCENTRATION UNITS	Character "ug/L" (aqueous); "ug/Kg" (soil); "ng" (amount added)
1	Delimiter	|
3	RESULT QUALIFIER	Character[1,2]
1	Delimiter	|
13	RESULTS	Numeric[3]
1	Delimiter	|
5	FLAGS	Character[4]
1	Delimiter	|
1	AMOUNT ADDED LABEL	"A" for Amt. added[5]
1	Delimiter	|
13	AMOUNT ADDED	Numeric
1	Delimiter	|

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1 When a Type 20 Record is used for calibration summary (MNC), the associated Type 30 Record uses "AVG" for average RRFs and Mean Calibration Factors. See Exhibit H Section 10.3.2.

2 For pesticide sample analysis, if an analyte is detected in only one of the two column analyses, report the analyte as "not detected" in both runs. Report result qualifier, for each column, as BDL. See Section 10.3.2 for result qualifiers.

| 3 Leave this field blank *only when* reporting non-detects.

4 A maximum of five flags (D,E,J,B,A,P,C,X,Y,Z, or N) with no space between the flags can be reported, each representing a qualification of the result as described in Exhibit B. For surrogates, the "D" flag will indicate surrogates diluted out.

5 For Matrix Spike/Matrix Spike Duplicate analysis, surrogate, SMC for VOA, SV, and PEST (Form 3s). Nominal Amount for Pesticides (Form
| *7E/7F*). Spike added for florisil and GPC (Form 9A/9B).

Results Data Record (Type 30) (Cont.)

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
1	CRQL LABEL	"U" for "undetected" or blank when analyte is detected
1	Delimiter	|
13	CRQL	Numeric
1	Delimiter	|
1	RSD LABEL	"R" for % Resolution/RSD[6]
1	Delimiter	|
5	RSD VALUE	Numeric
1	Delimiter	|
1	MS/MSD REC LABEL	"P" for % recovery [MS/MSD]/blank (for sample [except MS/MSD], standard, tune, blanks, calibration)
1	Delimiter	|
5	MS % RECOVERY	Numeric/blank (for everything except MS)
1	Delimiter	|
5	MSD % RECOVERY	Numeric/blank (for everything except MSD)
1	Delimiter	|
1	RPD LABEL	"D" for MS/MSD or for pesticide calibration verification (%D)/blank
1	Delimiter	|
5	RPD VALUE	Numeric/blank[7]
1	Delimiter	|
1	SURR/SPIKE RECOVERY LABEL	"S" for % recovery/blank (for non-surrogate/SMC and non-spike analytes
1	Delimiter	|
5	SURR/SPIKE RECOVERY	% Recovery/blank[8]

| 6 "R" for % Resolution (Form*s 6H, 6I, 6J, and 6K*) or for RSD of Response factors under Calibration summary (MNC) Type 20. (Blank for VOA and SV fractions.)

7 RPD for MS/MSD recoveries, or %D for pesticides. Calibration
| Verification (Form *7E/7F*). Otherwise, leave blank.

8 Surrogate (for SV and PEST)/SMC (for VOA) or Spike (Forms 2, Form 9A/9B) recovery. Leave blank for non-surrogate and non-spike analytes.

Results Data Record (Type 30) (Cont.)

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
1	Delimiter	|
1	MEAN CONCENTRATION LABEL	"M" for Mean conc. (for multicomponent PEST only)/blank (for VOA and SV)
1	Delimiter	|
13	MEAN CONCENTRATION	Numeric (for PEST)/blank (for VOA and SV)[9]
1	Delimiter	|
1	PERCENT DIFFERENCE LABEL	"F" or "P" (PEST)/blank (for VOA and SV field sample analysis)[10]
1	Delimiter	|
5	PERCENT DIFFERENCE	Numeric
1	Delimiter	|
1	INTERNAL STANDARD AREA LABEL	"I" for IS Area (for VOA and SV)/blank (for PEST)
1	Delimiter	|
13	INTERNAL STANDARD AREA	Numeric (for VOA and SV)/blank (for PEST)
1	Delimiter	|
5	RECORD SEQUENCE NO.	Numeric
4	CHECKSUM	Character

9 Mean Concentration for Multicomponent analytes detected in pesticide analyses.

10 "P" for Percent Difference between concentrations from two columns in pesticide analyses, or "F" for Percent Difference between average RRF (initial calibration) and RRF50 (continuing calibration) in VOA/SVOA analyses. Leave blank for volatile and semivolatile sample, blank, and tune analysis.

9.9 Auxiliary Data Record (Type 32)

Use: Used to report retention time (in minutes) for Internal Standards and for TICs (for Volatiles and Semivolatiles). Used to report retention time data and percent breakdown (for pesticides).

Position: Follows type 30. (Record will only be required as specified above.)

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
2	RECORD TYPE	"32"
3	Delimiters	|||
2	RETENTION TIME LABEL	"RT"
1	Delimiter	|
5	RETENTION TIME	Numeric
1	Delimiter	|
3	FIRST LIMIT LABEL	"RTF"
1	Delimiter	|
5	RT WINDOW LOWER LIMIT	Numeric
1	Delimiter	|
3	SECOND LIMIT LABEL	"RTT"
1	Delimiter	|
5	RT WINDOW UPPER LIMIT	Numeric
2	Delimiters	||
2	% BREAKDOWN LABEL	"PB" for % breakdown/blank (for VOA and SV)
1	Delimiter	|
5	% BREAKDOWN	Numeric (DDT/ENDRIN)/blank (for VOA and SV)
1	Delimiter	|
5	COMBINED % BREAKDOWN	Numeric/blank (for VOA and SV)[1]
2	Delimiters	||
1	PEAK	1 THROUGH 5 (for pesticide multicomponent compounds)/blank (for VOA and SV)[2]
1	Delimiter	|
5	RECORD SEQUENCE NO.	Numeric
4	CHECKSUM	Character

1 The combined %breakdown will be reported on both the record type 32s (for DDT and Endrin).

2 For positively identified compounds, a minimum of 3 peaks and a maximum of 5 peaks are allowed. Types 30 and 32 will be repeated for each peak that is reported (a minimum of three, a maximum of five times). This is for multicomponent analytes in pesticide analyses.

9.10 Name Record (Type 33)

Use: This record type is used for volatile and semivolatile analyses only to carry an analyte name for TICs. This record is not used for pesticide analysis.

Position: Follows types 30 and 32 for TICs.

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
2	RECORD TYPE	"33"
1	Delimiter	|
67	NAME OF COMPOUND	Character
1	Delimiter	|
5	RECORD SEQUENCE NO.	Numeric
4	CHECKSUM	Character

9.11 Instrumental Data Readout Record (Type 36)

Use: This record type is only used for volatile and semivolatile analyses to describe DFTPP/BFB percent abundances. This record is not used for pesticide analysis.

Position: Follows type 30 for DFTPP/BFB data.

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
2	RECORD TYPE	"36"
1	Delimiter	|
1	MASS LABEL	"M"
3	Delimiters	|||
3	FIRST MASS (DFTPP/BFB)	Numeric (DFTPP for SV or BFB for VOA)
2	Delimiters	||
5	FIRST PERCENT RELATIVE ABUNDANCE	Numeric
1	Delimiter	|
3	SECOND MASS	Numeric
1	Delimiter	|
5	SECOND PERCENT RELATIVE ABUNDANCE	Numeric
1	Delimiter	|
5	PERCENT MASS OF 69	Numeric, DFTPP only/blank (for VOA)
1	Delimiter	|
3	THIRD MASS	Numeric
1	Delimiter	|
5	THIRD PERCENT RELATIVE ABUNDANCE	Numeric
2	Delimiters	||
3	FOURTH MASS	Numeric
1	Delimiter	|
5	FOURTH PERCENT RELATIVE ABUNDANCE	Numeric
1	Delimiter	|
5	PERCENT MASS OF 69	Numeric, DFTPP only/blank (for VOA)
1	Delimiter	|
3	FIFTH MASS	Numeric
1	Delimiter	|
5	FIFTH PERCENT RELATIVE ABUNDANCE	Numeric
1	Delimiter	|
5	PERCENT MASS OF 174	Numeric, BFB only/blank (for SV)
1	Delimiter	|
3	SIXTH MASS	Numeric
1	Delimiter	|

Instrumental Data Readout Record (Type 36) (Cont.)

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
5	SIXTH PERCENT RELATIVE ABUNDANCE	Numeric
2	Delimiters	||
3	SEVENTH MASS	Numeric
1	Delimiter	|
5	SEVENTH PERCENT RELATIVE ABUNDANCE	Numeric
1	Delimiter	|
5	PERCENT MASS OF 174	Numeric, BFB only/blank (for SV)
1	Delimiter	|
3	EIGHTH MASS	Numeric
1	Delimiter	|
5	EIGHTH PERCENT RELATIVE ABUNDANCE	Numeric
1	Delimiter	|
5	PERCENT MASS OF 174	Numeric, BFB only/blank (for SV)
1	Delimiter	|
3	NINTH MASS	Numeric
1	Delimiter	|
5	NINTH PERCENT RELATIVE ABUNDANCE	Numeric
1	Delimiter	|
5	PERCENT MASS OF 176	Numeric, BFB only/blank (for SV)
1	Delimiter	|
3	TENTH MASS	Numeric/blank (for VOA)
1	Delimiter	|
5	TENTH PERCENT RELATIVE ABUNDANCE	Numeric/blank (for VOA)
2	Delimiters	||
3	ELEVENTH MASS	Numeric/blank (for VOA)
1	Delimiter	|
5	ELEVENTH PERCENT RELATIVE ABUNDANCE	Numeric/blank (for VOA)
2	Delimiters	||
3	TWELFTH MASS	Numeric/blank (for VOA)
1	Delimiter	|
5	TWELFTH PERCENT RELATIVE ABUNDANCE	Numeric/blank (for VOA)
2	Delimiters	||
3	THIRTEENTH MASS	Numeric/blank (for VOA)
2	Delimiters	||

Instrumental Data Readout Record (Type 36) (Cont.)

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
5	THIRTEENTH PERCENT RELATIVE ABUNDANCE	Numeric/blank (for VOA)
1	Delimiter	|
5	PERCENT MASS OF 442	Numeric, DFTPP only (blank for VOA)
1	Delimiter	|
5	RECORD SEQUENCE NO.	Numeric
4	CHECKSUM	Character

9.12 Comment Record (Type 90)

Use: To provide for operator-entered comments.
Position: May occur anywhere in the file after the type 10 record.

MAXIMUM LENGTH	CONTENTS	FORMAT/CONTENTS
2	RECORD TYPE	"90"
1	Delimiter	|
67	ANY COMMENT	Character
1	Delimiter	|
5	RECORD SEQUENCE NO.	Numeric
4	CHECKSUM	Character

10.0 DEFINITIONS OF VARIOUS CODES USED IN AGENCY STANDARD RECORDS

10.1 Quality Control and Related Codes (QCC) in Type 20 Records

10.1.1 Note: These codes appear in the QC code fields of type 20 records. They are used to indicate the type of data that is being reported.

QCC	Name	Definition
LRB	LABORATORY (REAGENT) BLANK	The "Method Blank" (see Exhibit G).
LIB	LABORATORY INSTRUMENT BLANK	The "Instrument Blank".
LSB	LABORATORY SULFUR BLANK	If different from "Method Blank" (pesticides).
LHB	LABORATORY STORAGE BLANK	The storage blank (volatiles).
FRB	*FIELD BLANK*	*This is any sample that is submitted from the field and is identified as a blank. This includes trip blanks, rinsates, equipment blanks, etc.*
FRM	*FIELD REFERENCE SAMPLE*	*This is any sample that is submitted for a Case and is identified as a Performance Evaluation (PE) sample.*
LSD	LABORATORY SPIKE DUPLICATE BACKGROUND (ORIGINAL) VALUES	An environmental sample which is analyzed according to the analytical method, and subsequently used for the matrix spike and the matrix spike duplicate (see Exhibit G).
LF1	LABORATORY SPIKED SAMPLE - FINAL - FIRST MEMBER	The "Matrix Spike" (see Exhibit G); must precede LF2.
LF2	LABORATORY SPIKED SAMPLE - FINAL - SECOND MEMBER	The "Matrix Spike Duplicate" (see Exhibit G).
LPC	LABORATORY PERFORMANCE CHECK SOLUTION	A solution of DFTPP (SVOA) or BFB (VOA) or method analytes (PEST/PCB) used to evaluate the performance of an instrument with respect to a defined set of criteria (Tune or Resolution Check Sample) (see Exhibit G).
FLO	FLORISIL CHECK SOLUTION	A solution of pesticides used to check recovery from each lot of Florisil cartridges. These recovery results will be provided in every production run where associated samples are analyzed.

GPC	GPC CHECK SOLUTION	A solution of pesticides used to check recovery from each new GPC calibration. These recovery results will be provided in every production run where associated samples are analyzed.
CLM	INITIAL CALIBRATION - MULTI-POINT	The Initial Calibration for GC/MS (see Exhibit G), or the Initial Individual Standard Mixes (A, B) for pesticides (see Exhibit D PEST). Response factors (GC/MS) or Calibration Factors (pesticides) will be reported on the following type 30 records.
CLS	INITIAL CALIBRATION SINGLE POINT	The Initial Toxaphene/Aroclor Mixes used to determine all calibration factors (see Exhibit D PEST).
CLC	CONTINUING CALIBRATION CHECK	The continuing calibration (*VSTD050/SSTD050*) for GC/MS.
CLE	CONTINUING PERFORMANCE CHECK	The subsequent Individual Standard Mixes (A,B), Performance Evaluation Mixture, and for subsequent injections of Toxaphene/Aroclor mixes for pesticides (see Exhibit D PEST).
CLD	DUAL PURPOSE CALIBRATION	A calibration solution as above used both as an initial calibration (CLM) and a continuing check (CLC). (50 level initial calibration if needed for Form 8.)

10.1.2 The following QCC values are used on type 20 records which act as a header, and indicate that additional (usually calculated) analyte specific data will be present on type 30 (and following type) records. Usually, these data will apply to an entire production run, in which case they will appear immediately following the type 10 record or type 11 record if present. If the data apply to only a portion of the samples in the run, they shall be placed immediately preceding the samples to which they apply. Much of the rest of the information in the type 20 record may be blank, indicating that these data do not apply to these results.

MNC	MEAN VALUES FROM CALIBRATIONS	The data following represent mean values and percent RSDs from the initial calibration (GC/MS) or the mean calibration factors, mean retention times and retention time windows (pesticides).

10.2 Codes For Sample Medium (Matrix, Sources)

Medium	Code
All Media, Specific Medium not Applicable. Use for Calibrations, Tunes, etc.	0 (zero)
Water	1
Soil	H

10.3 List of Sample and Result Qualifiers

Definition: A sample qualifier consists of three characters which act as an indicator of the fact and the reason that the subject analysis (a) did not produce a numeric result, or (b) produced a numeric result for an entire sample but it is qualified in some respect relating to the type or validity of the result.

10.3.1 Sample Qualifiers

Qualifier	Full Name	Definition
RIN	RE-ANALYZED	The indicated analysis results were generated from a re-injection of the same sample extract or aliquot (RE SUFFIX).
REX	RE-PREPARED	The indicated analysis results were generated from a re-extraction of the same sample (RE SUFFIX).
REJ	REJECTED	The results for the entire sample analysis have been rejected for an unspecified reason by the laboratory. For initial calibration data, these data were not utilized in the calculation of the mean.
SRN	DILUTED	The indicated analysis results were generated from a dilution of the same sample (DL SUFFIX).

10.3.2 Result Qualifiers in Type 30 Records

A result qualifier consists of three characters which act as an indicator of the fact and the reason that the subject analysis (a) did not produce a numeric result, or (b) produced a numeric result for a single analyte but it is qualified in some respect relating to the type or validity of the result. This qualifier is complementary to the flags field on a type 30 record. A TIC **must** have either a TIE, TFB, ALC, or PRE result qualifier.

BDL	BELOW DETECTABLE LIMITS	Indicates compound was analyzed for but not detected (Form 1 "U" Flag).
NAR	NO ANALYSIS RESULT	There is no analysis result required for this subject parameter.

AVG	AVERAGE VALUE	Average value -- used to report a range of values (e.g., relative response factors).
CBC	CANNOT BE CALCULATED	The analysis result cannot be calculated because an operand value is qualified (e.g., identifies analytes whose internal standard is not found) (Form 1 "X" Flag).
LTL	LESS THAN LOWER CALIBRATION LIMIT	Analysis result is from a diluted sample (DL suffix) and may be less accurate than the result from an undiluted sample (Form 1 "D" Flag).
GTL	GREATER THAN UPPER CALIBRATION LIMIT	Actual value is known to be greater than the upper calibration range (Form 1 "E" Flag).
LLS	LESS THAN LOWER STANDARD	The analysis result is less than the sample quantitation limit (Form 1 "J" Flag).
TIE	TENTATIVELY IDENTIFIED ESTIMATED VALUE	The indicated analyte is a tentatively identified analyte; its concentration has been estimated (Form 1-F or *1-G* "J" Flag).
REJ	REJECTED	Results for the analyte are rejected by the laboratory.
STD	INTERNAL STANDARD	The indicated compound is an internal standard.
STB	INTERNAL STANDARD BELOW DETECTION LIMITS	A combination of "STD" and "BDL".
FBK	FOUND IN BLANK	The indicated compound was found in the associated method blank (LRB) as well as the sample (Form 1 "B" Flag).
TFB	TENTATIVELY IDENTIFIED AND FOUND IN BLANK	A Combination of "TIE" and "FBK" (Form 1-F or *1-G* "B" Flag).
ALC	ALDOL CONDENSATION	Labels a suspected Aldol Condensation-product for TICs (Form 1-*G* "A" Flag).
NRP	NON-REPRODUCIBLE	Results of two or more injections are not comparable (Form 1-*E* "P" flag), e.g., Aroclor target analyte with greater than 25% difference between mean concentrations of the two column analyses.
PRE	PRESUMPTIVE PRESENCE	Presumptive evidence of presence of material for TIC (Form 1-F or *1-G* "N" Flag).

APPENDIX A -- FORMAT OF RECORDS FOR SPECIFIC USES

The USEPA does not warrant or guarantee the completeness and/or accuracy of the representative examples of record type uses provided in this appendix. This appendix serves as an example for the usage of record types and in no way redefines or supersedes the specifications or requirements stated in Exhibits A through H of *OLM04.2*. NOTE: Examples are representative and are not typically provided for both columns used in the pesticide analysis.

Appendix A -- Format of Records for Specific Uses

Table of Contents

1.0 VOLATILES

1.1 Record Type 10 for Volatiles

| 10||||||GC/MS|*OLM04.2V*||TESLAB||||68D00001|INSTV1||TEST LABS INC.||000012C33

1.2 Record Type 11 for Volatiles

11|DB-5||0.53||||||||||000024CD9

1.3 Record Type 20s and 30s for Volatiles -- Initial Calibration Mean Values (QC Code 'MNC')

20|||0|MNC||18000|X1201|||||||||36|||000036668

30|C|74873|||AVG|0.531||||||R|17.0|||||||||||||0000486BE

30|C|74839|||AVG|1.536||||||R|11.1|||||||||||||00005A717

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1.4 Record Type 20s and 30s for Volatiles -- BFB Tune (QC Code 'LPC')

| 20|||0|LPC||18000|X1201|*1992*|04|25|01|01||||1|||0004011E3

21|N||||||BFB01||||||||||0004121B2

30|C|460004|||||||||||||||||||||||||00042388C

36|M|||50||18.8|75|45.5||95|100.0||96|7.2||173|0.0|0.0|174|72.8||175|5.7|7.8|176|71.6|98.3|177|4.9|6.8||||| |||||||||000439122

1.5 Record Type 20s and 30s for Volatiles -- Initial Calibration Standard (QC Code 'CLM')

| 20||*VSTD020*|0|CLM||18000|X1201|*1992*|03|25|09|42||||36|||00044B8F2

21|N||||||STD01||||||||||00045C944

| 23|P|*1992*|04|25|01|01|BFB01|||||||||||||||||||||||||00046EA64

30|C|74873|74975|||0.563|||||||||||||||||||000470F21

30|C|74839|74975|||1.528|||||||||||||||||||0004833E2

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1.6 Record Type 20s and 30s for Volatiles -- Dual Purpose Calibration Standard (QC Code 'CLD')

| 20||VSTD050|0|CLD||18000|X1201|*1992*|05|25|10|25||||39|||0014300AA

21|N||||||CSTD01||||||||||00144117D

| 23|P|*1992*|05|30|05|01|BFB02|||||||||||||||||||||||||0014532A2

30|C|74873|74975|||0.931|||||||||||||||||||001465B66

30|C|74839|74975|||1.821|||||||||||||||||||00147842C

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30|C|17060070|74975|||2.089|||||||||||||||||||001810B47

30|C|3114554|||STD|||A|50.0|||||||||||||||I|109281|001822EDB

32|||RT|15.74||||||||||001833EF5

30|C|540363|||STD|||A|50.0|||||||||||||||I|125103|00184618CB

32|||RT|9.97||||||||||0018570D13

30|C|74975|||STD|||A|50.0|||||||||||||||I|26084|0018691EDC

32|||RT|8.00||||||||||00187A10C

1.7 Record Type 20s and 30s for Volatiles -- Continuing Calibration Standard (QC Code 'CLC')

| 20||VSTD050|0|CLC||18000|X1201|*1992*|05|30|05|25||||39|||0024300AD

21|N||||||CSTD01||||||||||00244117F

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|       23|P|1992|05|30|05|01|BFB02|||||||||||||||||||||||||||0024532A1

        30|C|74873|74975|||0.961|||||||||||||||F|81.0|||002465B65

        30|C|74839|74975|||1.803|||||||||||||||F|17.4|||00247842A

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        30|C|17060070|74975|||2.089|||||||||||||||F|10.6|||002810B46

        30|C|3114554|||STD|||A|50.0|||||||||||||||I|109281|002822EDA

        32|||RT|15.74||||||||||002833EF3

        30|C|540363|||STD|||A|50.0|||||||||||||||I|125103|00284618C

        32|||RT|9.97||||||||||0028570D1

        30|C|74975|||STD|||A|50.0|||||||||||||||I|26084|0028691ED

        32|||RT|8.00||||||||||00287A10D
```

1.8 Record Type 20s and 30s for Volatiles -- Method Blank (QC Code 'LRB')

```
|       20||VBLK01|1|LRB||18000|X1201|1992|05|30|06|11||ML|5.0|39|||00288CB9F

        21|N|L|||||FBLK01||||||||||00289DCF6

|       22|1992|05|30|05|25|CSTD01|||||1.0||||00290F6D3

|       23|P|1992|05|30|05|01|BFB02|||||||||||||||||P|0|T|0|||||002911B17

|       30|C|74873|74975|UG/L|BDL||U|||U|10|||||||||||||||002923881

|       30|C|74839|74975|UG/L|BDL||U|||U|10|||||||||||||||0029355ED

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        30|C|2037265|3114554|UG/L||47.9||A|50.0|||||||||S|96|||||||003251E4B

        30|C|460004|3114554|UG/L||47.0||A|50.0|||||||||S|94|||||||0032647E1
```

30|C|17060070|74975|UG/L||50.3||A|50.0|||||||||S|101|||||||003277241

30|C|3114554|||STD|||A|50.0|||||||||||||||I|104439|0032895DF

32|||RT|15.70|||||||||||00329A5EA

30|C|540363|||STD|||A|50.0|||||||||||||||I|135938|00330C8A8

32|||RT|9.92|||||||||||00331D7DE

30|C|74975|||STD|||A|50.0|||||||||||||||I|26488|00332F90C

32|||RT|8.00|||||||||||00333082C

1.9 Record Type 20s and 30s for Volatiles -- Storage Blank (QC Code 'LHB')

| 20||VHBLK01|1|LHB||18000|X1201|*1992*|05|30|06|21||ML|5.0|39|||00688CB9F

21|N|L|||||FHBLK01|||||||||||00689DCF6

| 22|*1992*|05|30|05|25|CSTD01|||||1.0||||00690F6D3

| 23|P|*1992*|05|30|05|01|BFB02|||||||||||MB|*1992*|05|30|06|11|FBLK01|P|0|T|0
|||||006911B17

| 30|C|74873|*74975*|UG/L|BDL||U|||U|10|||||||||||||||006923881

| 30|C|74839|*74975*|UG/L|BDL||U|||U|10|||||||||||||||0069355ED

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30|C|2037265|3114554|UG/L||47.9||A|50.0|||||||||S|96|||||||007251E4B

30|C|460004|3114554|UG/L||47.0||A|50.0|||||||||S|94|||||||0072647E1

30|C|17060070|74975|UG/L||50.3||A|50.0|||||||||S|101|||||||007277241

30|C|3114554|||STD|||A|50.0|||||||||||||||I|104439|0072895DF

32|||RT|15.70|||||||||||00729A5EA

30|C|540363|||STD|||A|50.0|||||||||||||||I|135938|00730C8A8

32|||RT|9.92|||||||||||00731D7DE

30|C|74975|||STD|||A|50.0|||||||||||||||I|26488|00732F90C

32|||RT|8.00||||||||||00733082C

1.10 Record Type 20s and 30s for Volatiles -- Instrument Blank (QC Code 'LIB')

| 20||VIBLK01|1|LIB||18000|X1201|*1992*|05|30|06|30||ML|5.0|39|||00688CB9F

21|N|L|||||FIBLK01||||||||||00689DCF6

| 22|*1992*|05|30|05|25|CSTD01|||||1.0||||00690F6D3

| 23|P|*1992*|05|30|05|01|BFB02||||||||||MB|*1992*|05|30|06|11|FBLK01|P|0|T|0
|||||006911B17

| 30|C|74873|*74975*|UG/L|BDL||U|||U|10|||||||||||||||006923881

| 30|C|74839|*74975*|UG/L|BDL||U|||U|10|||||||||||||||0069355ED

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30|C|2037265|3114554|UG/L||47.9||A|50.0|||||||||S|96|||||||007251E4B

30|C|460004|3114554|UG/L||47.0||A|50.0|||||||||S|94|||||||0072647E1

30|C|17060070|74975|UG/L||50.3||A|50.0|||||||||S|101|||||||007277241

30|C|3114554|||STD|||A|50.0|||||||||||||||I|104439|0072895DF

32|||RT|15.70||||||||||00729A5EA

30|C|540363|||STD|||A|50.0|||||||||||||||I|135938|00730C8A8

32|||RT|9.92||||||||||00731D7DE

30|C|74975|||STD|||A|50.0|||||||||||||||I|26488|00732F90C

32|||RT|8.00||||||||||00733082C

1.11 Record Type 20s and 30s for Volatiles -- Regular Field Sample (QC Code field is blank)

| 20||X1200|1|||18000|X1201|*1992*|05|30|06|37||ML|5.0|39|||0033432DB

| 21|N|L|||||FX1200|||||*1992*|05|27||||003354C2D

| 22|*1992*|05|30|05|25|CSTD01|||||1.0||||00336660A

| 23|P|*1992*|05|30|05|01|BFB02|HB|*1992*|05|30|06|21|FHBLK01||||MB|*1992*|05|30|06|11|FBLK01|P|0|T|2||||0|003379931

| 30|C|74873|*74975*|UG/L|BDL||U|||U|10|||||||||||||||00338B69B

| 30|C|74839|*74975*|UG/L|BDL||U|||U|10|||||||||||||||00339D407

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30|C|2037265|3114554|UG/L||51.8||A|50.0|||||||||S|102|||||||00271A07D

30|C|460004|3114554|UG/L||59.0||A|50.0|||||||||S|98|||||||00272CA19

30|C|17060070|74975|UG/L||54.3||A|50.0|||||||||S|107|||||||00273F48C

30|C|3114554|||STD|||A|50.0|||||||||||||||I|96179|002741762

32|||RT|15.66|||||||||||00275277B

30|C|540363|||STD|||A|50.0|||||||||||||||I|123502|002764A14

32|||RT|9.91|||||||||||002775948

30|C|74975|||STD|||A|50.0|||||||||||||||I|26331|002787A4A

32|||RT|7.96|||||||||||00279898B

30|C|||UG/L|TIE|9|||||||||||||||||||002807A4A

32|||RT|2.90|||||||||||00281898B

| 33|*UNKNOWN*|00281898B

30|C|74630527||UG/L|TIE|1|JN|||||||||||||||||||002827A4A

32|||RT|25.20||||||||||00283898B

33|3-UNDECENE, 6-METHYL-, (E)-|00284898B

1.12 Record Type 20s and 30s for Volatiles -- Field Sample chosen for MS/MSD (QC Code 'LSD')

| 20||X1201|1|LSD||18000|X1201|*1992*|05|30|06|37||ML|5.0|39|||0033432DB

| 21|N|L|||||FX1201LSD|||||*1992*|05|27||||003354C2D

| 22|*1992*|05|30|05|25|CSTD01|||||1.0||||00336660A

| 23|P|*1992*|05|30|05|01|BFB02|HB|*1992*|05|30|06|21|FHBLK01||||MB|*1992*|05|30|06|11|FBLK01|P|0|T|0||||0|003379931

| 30|C|74873|*74975*|UG/L|BDL||U|||U|10|||||||||||||||00338B69B

| 30|C|74839|*74975*|UG/L|BDL||U|||U|10|||||||||||||||00339D407

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30|C|2037265|3114554|UG/L||50.8||A|50.0|||||||||S|102|||||||00371A07D

30|C|460004|3114554|UG/L||49.0||A|50.0|||||||||S|98|||||||00372CA19

30|C|17060070|74975|UG/L||53.3||A|50.0|||||||||S|107|||||||00373F48C

30|C|3114554|||STD|||A|50.0|||||||||||||||I|96178|003741762

32|||RT|15.65||||||||||00375277B

30|C|540363|||STD|||A|50.0|||||||||||||||I|123501|003764A14

32|||RT|9.90||||||||||003775948

30|C|74975|||STD|||A|50.0|||||||||||||||I|26330|003787A4A

32|||RT|7.95||||||||||00379898B

1.13 Record Type 20s and 30s for Volatiles -- Matrix Spike Sample (QC Code 'LF1')

| 20||X1201MS|1|LF1||18000|X1201|*1992*|05|30|07|14||ML|5.0|39|||00380B5C1

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|       21|N|L|||||FX1201LF1|||||1992|05|27||||00381CF38

|       22|1992|05|30|05|25|CSTD01|||||1.0||||00382E915

|       23|P|1992|05|30|05|01|BFB02|HB|1992|05|30|06|21|FHBLK01||||MB|1992|05|30
        |06|11|FBLK01|P|0|||S|0|R|0|003831CEC

|       30|C|74873|74795|UG/L|BDL||U|||U|10|||||||||||||||003843A56

        ......

        30|C|75354|74975|UG/L||40||A|50.00|||||P|80||D|4|||||||||003911212

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        30|C|79016|540363|UG/L||46||A|50.00|||||P|92||D|4|||||||||004026477

        ......

        30|C|71432|540363|UG/L||46||A|50.00|||||P|92||D|2|||||||||00405C84B

        ......

        30|C|108883|3114554|UG/L||45||A|50.00|||||P|91||D|6|||||||||00412ABC4

        30|C|108907|3114554|UG/L||44||A|50.00|||||P|88||D|7|||||||||00413D5FF

        ......

        30|C|2037265|3114554|UG/L||46.1||A|50.0||||||||||S|92|||||||004175BA7

        30|C|460004|3114554|UG/L||46.7||A|50.0||||||||||S|93|||||||004188542

        30|C|17060070|74975|UG/L||54.3||A|50.0||||||||||S|109|||||||00419AFC2

        30|C|3114554|||STD|||A|50.0|||||||||||||||I|101076|00420D350

        32|||RT|15.70||||||||||00421E35B

        30|C|540363|||STD|||A|50.0|||||||||||||||I|125573|004220613

        32|||RT|9.92||||||||||004231549

        30|C|74975|||STD|||A|50.0|||||||||||||||I|26701|004243657

        32|||RT|7.98||||||||||00425459B
```

1.14 Record Type 20s and 30s for Volatiles -- Matrix Spike Duplicate Sample (QC Code 'LF2')

```
|       20||X1201MSD|1|LF2||18000|X1201|1992|05|30|07|55||ML|5.0|39|||00426726B

|       21|N|L|||||FX1201LF2|||||1992|05|27||||004278BE3

|       22|1992|05|30|05|25|CSTD01|||||1.0||||00428A5C0

|       23|P|1992|05|30|05|01|BFB02|HB|1992|05|30|06|21|FHBLK01||||MB|1992|05|30
        |06|11|FBLK01|P|0|||S|0|R|0|00429D997

|       30|C|74873|74975|UG/L|BDL||U|||U|10|||||||||||||||00430F701

        ......

        30|C|75354|74975|UG/L||38||A|50.00|||||P||77|D|4|||||||||00437CED4

        ......

        30|C|79016|540363|UG/L||44||A|50.00|||||P||88|D|4|||||||||004482146

        ......

        30|C|71432|540363|UG/L||47||A|50.00|||||P||94|D|2|||||||||004518527

        ......

        30|C|108883|3114554|UG/L||48||A|50.00|||||P||97|D|6|||||||||0045868B3

        30|C|108907|3114554|UG/L||47||A|50.00|||||P||94|D|7|||||||||0045992EE

        ......

        30|C|2037265|3114554|UG/L||49.2||A|50.0||||||||||S|98|||||||0046318AA

        30|C|460004|3114554|UG/L||47.6||A|50.0||||||||||S|95|||||||004644251

        30|C|17060070|74975|UG/L||55.2||A|50.0||||||||||S|110|||||||004656CBF

        30|C|3114554|||STD|||A|50.0|||||||||||||||I|101145|00466904A

        32|||RT|15.70||||||||||00467A055

        30|C|540363|||STD|||A|50.0|||||||||||||||I|124184|00468C30A
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32|||RT|9.94||||||||||00469D24C

30|C|74975|||STD|||A|50.0|||||||||||||||I|26683|00470F36D

32|||RT|7.98||||||||||0047102B1
```

2.0 SEMIVOLATILES

2.1 Record Type 10 for Semivolatiles

| 10||||||GC/MS|*OLM04.2B*||TESLAB||||68D00001|INSTB1||TEST LABS INC.||000002BA9

2.2 Record Type 11 for Semivolatiles

11|XRT-1||0.52||||||||||000024C8D

2.3 Record Type 20s and 30s for Semivolatiles -- Initial Calibration Mean Values (QC Code 'MNC')

20|||0|MNC||18000|X1201|||||||||72|||00003661C

| 30|C|108952|*3855821*||AVG|1.817||||||R|7.2|||||||||||||000048677

| 30|C|111444|*3855821*||AVG|1.607||||||R|6.2|||||||||||||00005A6C4

| 30|C|95578|*3855821*||AVG|1.375||||||R|3.1|||||||||||||00006C650

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| 30|C|93951736|*3855821*||AVG|1.221||||||R|5.3|||||||||||||000745BDE

| 30|C|2199691|*3855821*||AVG|0.911||||||R|2.0|||||||||||||000757D0A

2.4 Record Type 20s and 30s for Semivolatiles -- DFTPP Tune (QC Code 'LPC')

| 20|||0|LPC||18000|X1201|*1992*|05|01|00|32||||1|||000769E6E

21|||||||DFTPP01||||||||||00077AF43

30|C|5074715|||||||||||||||||||||||||00078C71C

36|M|||51||41.9|68|0.5|1.3|69|37.6||70|0.0|0.0|127|45.2||197|0.4||198|100.0||199|8.0||275|25.0||365|3.69||441|13.7||442|99.1||443||20.8|21.0|000793554

2.5 Record Type 20s and 30s for Semivolatiles -- Initial Calibration Standard (QC Code 'CLM')

| 20||SSTD080|0|CLM||18000|X1201|*1992*|05|01|02|01||||72|||00155B94D

21|||||||STD02||||||||||00156C8F3

| 23|P|*1992*|05|01|00|32|DFTPP01|||||||||||||||||||||||||||00157EBBA

30|C|108952|3855821|||1.853|||||||||||||||||||0015812F5

30|C|111444|3855821|||1.599|||||||||||||||||||001593A37

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30|C|93951736|3855821|||1.248||A|40.000|||||||||||||||||00228C51D

30|C|2199691|3855821|||0.928||A|40.000|||||||||||||||||00229ED4C

2.6 Record Type 20s and 30s for Semivolatiles -- Dual Purpose Calibration Standard (QC Code 'CLD')

| 20||*SSTD050*|0|CLD||18000|X1201|*1992*|05|01|02|40||||72|||0045914F6

21|||||||STD03||||||||||00460249D

| 23|P|*1992*|05|01|00|32|DFTPP01|||||||||||||||||||||||||||004614764

30|C|108952|3855821|||1.462|||||||||||||||||||004623B3A

30|C|111444|3855821|||1.233|||||||||||||||||||00463664C

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30|C|2199691|3855821|||0.828|||||||||||||||||||0053318F0

30|C|1146652|||STD|||A|20.0|||||||||||||||I|58474|005343BC2

32|||RT|7.23||||||||||005354AE6

30|C|15067262|||STD|||A|20.0|||||||||||||||I|27242|005366E6F

32|||RT|9.17||||||||||005377DA2

30|C|1517222|||STD|||A|20.0|||||||||||||||I|38472|00538A043

32|||RT|10.82||||||||||00539B042

30|C|1520963|||STD|||A|20.0|||||||||||||||I|18770|00540D2F2

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32|||RT|17.95||||||||||00541E310

30|C|1719035|||STD|||A|20.0|||||||||||||||I|24292|0054205B2

32|||RT|14.22||||||||||0054315AF

30|C|3855821|||STD|||A|20.0|||||||||||||||I|17522|00544385F

32|||RT|5.87||||||||||00545479F
```

2.7 Record Type 20s and 30s for Semivolatiles -- Continuing Calibration Standard (QC Code 'CLC')

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|     20||SSTD050|0|CLC||18000|X1201|1992|06|01|11|30||||78|||00459DC7F

      21|||||||CCSTD01||||||||||00460ED24

|     23|P|1992|06|01|11|01|DFTPP02|||||||||||||||||||||||||||004610FEB

      30|C|108952|3855821|||1.462|||||||||||||||F|19.5|||004623B3A

      30|C|111444|3855821|||1.233|||||||||||||||F|23.3|||00463664C

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      30|C|2199691|3855821|||0.828|||||||||||||||F|9.1|||0053318F0

      30|C|1146652|||STD|||A|20.0|||||||||||||||I|58474|005343BC2

      32|||RT|7.23||||||||||005354AE6

      30|C|15067262|||STD|||A|20.0|||||||||||||||I|27242|005366E6F

      32|||RT|9.17||||||||||005377DA2

      30|C|1517222|||STD|||A|20.0|||||||||||||||I|38472|00538A043

      32|||RT|10.82||||||||||00539B042

      30|C|1520963|||STD|||A|20.0|||||||||||||||I|18770|00540D2F2

      32|||RT|17.95||||||||||00541E310

      30|C|1719035|||STD|||A|20.0|||||||||||||||I|24292|0054205B2
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        32|||RT|14.22||||||||||0054315AF

        30|C|3855821|||STD|||A|20.0|||||||||||||||I|17522|00544385F

        32|||RT|5.87||||||||||00545479F
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2.8 Record Type 20s and 30s for Semivolatiles -- Method Blank (QC Code 'LRB')

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|       20||SBLK32|1|LRB||18000|X1201|1992|06|01|12|10||ML|1000|78|||005467308

|       21||L||C|||FSBLK01|1992|03|30||||||2.0||005478CBB

|       22|1992|06|01|11|30|CCSTD01||||1000|1.0||||00548AA6D

|       23|P|1992|06|01|11|01|DFTPP02|||||||||||||||||P|0|T|0|||||00549D056

|       30|C|108952|3855821|UG/L|BDL||U|||U|10|||||||||||||||00550EE8E

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        30|C|4165600|1520963|UG/L||40.9||A|50.0|||||||||S|82|||||||006147181

        30|C|321608|15067262|UG/L||42.8||A|50.0|||||||||S|86|||||||006159BF9

        30|C|98904439|1719035|UG/L||52.0||A|50.0|||||||||S|104|||||||00616C83A

        30|C|4165622|3855821|UG/L||67.2||A|75.0|||||||||S|90|||||||00617F2D2

        30|C|367124|3855821|UG/L||61.7||A|75.0|||||||||S|82|||||||006181C81

        30|C|118796|15067262|UG/L||70.9||A|75.0|||||||||S|95|||||||00619472C

        30|C|93951736|3855821|UG/L||69.2||A|75.0|||||||||S|92|||||||0062072BF

        30|C|2199691|3855821|UG/L||38.9||A|50.0|||||||||S|78|||||||006219D66

        30|C|1146652|||STD|||A|20.0|||||||||||||||I|94564|00622C038

        32|||RT|7.72||||||||||00623CF6A

        30|C|15067262|||STD|||A|20.0|||||||||||||||I|46152|00624F2FE

        32|||RT|9.65||||||||||00625023E
```

30|C|1517222|||STD|||A|20.0|||||||||||||||I|65936|0062624EE

32|||RT|11.32|||||||||||0062734DF

30|C|1520963|||STD|||A|20.0|||||||||||||||I|35768|00628579F

32|||RT|18.44|||||||||||0062967B8

30|C|1719035|||STD|||A|20.0|||||||||||||||I|43708|006308A67

32|||RT|14.70|||||||||||006319A71

30|C|3855821|||STD|||A|20.0|||||||||||||||I|29752|00632BD33

32|||RT|6.35|||||||||||00633CC63

2.9 Record Type 20s and 30s for Semivolatiles -- Regular Field Sample (QC Code field is blank)

| 20||X1201|1|||18000|X1201|*1992*|06|01|12|20||ML|1000|78|||00434F7E4

| 21||L||C|||FX1201|*1992*|05|30||*1992*|05|27||2.0||0043518E4

| 22|*1992*|06|01|11|30|CCSTD01||||1000|1.0||||004363696

| 23|P|*1992*|06|01|11|01|DFTPP02|||||||||||MB|*1992*|04|01|15|14|FSBLK01|P|0|T|0||||0|004376C26

| 30|C|108952|*3855821*|UG/L|BDL||U|||U|10|||||||||||||||004388A5E

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30|C|4165600|1520963|UG/L||43.0||A|50.0|||||||||S|86|||||||005020B12

30|C|321608|15067262|UG/L||48.3||A|50.0|||||||||S|97|||||||00503358D

30|C|98904439|1719035|UG/L||51.8||A|50.0|||||||||S|104|||||||0050461DF

30|C|4165622|3855821|UG/L||69.8||A|75.0|||||||||S|93|||||||005058C8C

30|C|367124|3855821|UG/L||69.6||A|75.0|||||||||S|93|||||||00506B64E

30|C|118796|15067262|UG/L||79.5||A|75.0|||||||||S|106|||||||00507E1D3

30|C|93951736|3855821|UG/L||73.0||A|75.0|||||||||S|97|||||||005080D64

30|C|2199691|3855821|UG/L||45.6||A|50.0|||||||||S|91|||||||005093801

30|C|3855821|||STD|||A|20.0|||||||||||||||I|30288|005105AB5

32|||RT|6.38||||||||||0051169E8

30|C|1146652|||STD|||A|20.0|||||||||||||||I|96100|005128C90

32|||RT|7.75||||||||||005139BCF

30|C|15067262|||STD|||A|20.0|||||||||||||||I|47432|00514BF65

32|||RT|9.67||||||||||00515CEA7

30|C|1517222|||STD|||A|20.0|||||||||||||||I|71076|00516F145

32|||RT|11.34||||||||||005170142

30|C|1719035|||STD|||A|20.0|||||||||||||||I|36728|0051823F5

32|||RT|14.74||||||||||00519340D

30|C|1520963|||STD|||A|20.0|||||||||||||||I|27356|0052056BD

32|||RT|18.49||||||||||0052166DB

2.10 Record Type 20s and 30s for Semivolatiles -- Field Sample Chosen for MS/MSD (QC Code 'LSD')

| 20||X1201|1|LSD||18000|X1201|*1992*|06|01|12|50||ML|1000|78|||00634F7E4

| 21||L||C|||FX1201LSD|*1992*|05|30||*1992*|05|27||2.0||0063518E4

| 22|*1992*|06|01|11|30|CCSTD01||||1000|1.0||||006363696

| 23|P|*1992*|06|01|11|01|DFTPP02||||||||||MB|*1992*|04|01|15|14|FSBLK01|P|0|T|0||||0|006376C26

| 30|C|108952|*3855821*|UG/L|BDL||U|||U|10|||||||||||||||006388A5E

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30|C|4165600|1520963|UG/L||43.0||A|50.0|||||||||S|86|||||||007020B12

30|C|321608|15067262|UG/L||48.3||A|50.0|||||||||S|97|||||||00703358D

30|C|98904439|1719035|UG/L||51.8||A|50.0|||||||||S|104|||||||0070461DF

30|C|4165622|3855821|UG/L||69.8||A|75.0|||||||||S|93|||||||007058C8C

30|C|367124|3855821|UG/L||69.6||A|75.0|||||||||S|93|||||||00706B64E

30|C|118796|15067262|UG/L||79.5||A|75.0|||||||||S|106|||||||00707E1D3

30|C|93951736|3855821|UG/L||73.0||A|75.0|||||||||S|97|||||||007080D64

30|C|2199691|3855821|UG/L||45.6||A|50.0|||||||||S|91|||||||007093801

30|C|3855821|||STD|||A|20.0|||||||||||||||I|30288|007105AB5

32|||RT|6.38||||||||||0071169E8

30|C|1146652|||STD|||A|20.0|||||||||||||||I|96100|007128C90

32|||RT|7.75||||||||||007139BCF

30|C|15067262|||STD|||A|20.0|||||||||||||||I|47432|00714BF65

32|||RT|9.67||||||||||00715CEA7

30|C|1517222|||STD|||A|20.0|||||||||||||||I|71076|00716F145

32|||RT|11.34||||||||||007170142

30|C|1719035|||STD|||A|20.0|||||||||||||||I|36728|0071823F5

32|||RT|14.74||||||||||00719340D

30|C|1520963|||STD|||A|20.0|||||||||||||||I|27356|0072056BD

32|||RT|18.49||||||||||0072166DB

2.11 Record Type 20s and 30s for Semivolatiles -- Matrix Spike Sample (QC Code 'LF1')

| 20||X1201MS|1|LF1||18000|X1201|*1992*|06|01|13|34||ML|500|78|||00722931C

| 21||L||C|||FX1201LF1|*1992*|05|30||*1992*|05|27||2.0||00723B441

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|       22|1992|06|01|11|30|CCSTD01||||500|1.0||||00724D125

|       23|P|1992|06|01|11|01|DFTPP02||||||||||MB|1992|06|01|12|10|FSBLK01|P|0|
        ||S|0|R|0|00725074C

        30|C|108952|3855821|UG/L||61||A|75.00|||||P|82||D|2|||||||||007263177

|       30|C|111444|3855821|UG/L|BDL||U|||U|10|||||||||||||||007274FA5

        30|C|95578|3855821|UG/L||61||A|75.00|||||P|81||D|1|||||||||00728790F

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        30|C|4165600|1520963|UG/L||37.8||A|50.0|||||||||S|76|||||||0079035AC

        30|C|321608|15067262|UG/L||40.3||A|50.0|||||||||S|81|||||||007916004

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        30|C|2199691|3855821|UG/L||38.4||A|50.0|||||||||S|77|||||||007976162

        30|C|1146652|||STD|||A|20.0|||||||||||||||I|101044|0079884E0

        32|||RT|7.70||||||||||007999410

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        30|C|1719035|||STD|||A|20.0|||||||||||||||I|37488|008064F42

        32|||RT|14.69||||||||||008075F5E

        30|C|3855821|||STD|||A|20.0|||||||||||||||I|30512|0080881FE

        32|||RT|6.33||||||||||008099122
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2.12 Record Type 20s and 30s for Semivolatiles -- Matrix Spike Duplicate Sample (QC Code 'LF2')

```
|       20||X1201MSD|1|LF2||18000|X1201|1992|06|01|14|05||ML|500|78|||00810BDF7
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|       21||L||C|||FX1201LF2|1992|05|30||1992|05|27||2.0||00811DF1D

|       22|1992|06|01|11|30|CCSTD01||||500|1.0||||00812FC01

|       23|P|1992|06|01|11|01|DFTPP02||||||||||MB|1992|06|01|12|10|FSBLK01|P|0|
        ||S|0|R|0|008133228

        30|C|108952|3855821|UG/L||63||A|75.00|||||P||84|D|2|||||||||008145C61

        30|C|111444||UG/L|BDL||U|||U|10|||||||||||||||008157A8F

        30|C|95578|3855821|UG/L||61||A|75.00|||||P||82|D|1|||||||||00816A3FA

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        30|C|4165600|1520963|UG/L||39.2||A|50.0|||||||||S|78|||||||0087865AD

        30|C|321608|15067262|UG/L||40.1||A|50.0|||||||||S|80| ||||||008799002

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        30|C|1146652|||STD|||A|20.0|||||||||||||||I|100060|00886B4FA

        32|||RT|7.73||||||||||00887C42D

        30|C|15067262|||STD|||A|20.0|||||||||||||||I|50488|00888E7D2

        32|||RT|9.65||||||||||00889F712

        30|C|1517222|||STD|||A|20.0|||||||||||||||I|77500|0089019AE

        32|||RT|11.32||||||||||00891299F

        30|C|1520963|||STD|||A|20.0|||||||||||||||I|29384|008924C52

        32|||RT|18.44||||||||||008935C6B

        30|C|1719035|||STD|||A|20.0|||||||||||||||I|39388|008947F23

        32|||RT|14.70||||||||||008958F2D
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30|C|3855821|||STD|||A|20.0|||||||||||||||I|29976|00896B201

32|||RT|6.37||||||||||00897C133
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3.0 PESTICIDES (COL. 1)

3.1 Record Type 10 for Pesticides (Col 1)

| 10||||||GC|*OLM04.2P*||TESLAB||||68D00001|INSTP1||TEST LABS INC.||000002A30

3.2 Record Type 11 for Pesticides (Col 1)

11|DB-5||0.53||||||||||0000249FA

3.3 Record Type 20s and 30s for Pesticides (Col 1) -- Initial Calibration Mean Values (QC Code 'MNC')

20|||0|MNC||18000|X1201|||||||||61|||000036387

30|C|319846|||AVG|834490||||||R|6|||||||||||||000048346

32|||RT|6.92|RTF|6.87|RTT|6.97|||||||000059DCB

30|C|319857|||AVG|272332||||||R|12|||||||||||||00006BE34

32|||RT|8.24|RTF|8.19|RTT|8.29|||||||00007D89C

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30|C|5103742|||AVG|706395||||||R|13|||||||||||||00042FD21

32|||RT|11.87|RTF|11.80|RTT|11.94|||||||000431A0A

30|C|8001352||||13757|||||||||||||||||||00044363C

32|||RT|14.84|RTF|14.77|RTT|14.91||||||1|000455429

30|C|8001352||||7373|||||||||||||||||||000466F72

32|||RT|15.47|RTF|15.40|RTT|15.54||||||2|000478D57

30|C|8001352||||10643|||||||||||||||||||00048A976

32|||RT|16.04|RTF|15.97|RTT|16.11||||||3|00049C748

30|C|8001352||||17393|||||||||||||||||||00050E370

32|||RT|17.23|RTF|17.16|RTT|17.30||||||4|000510136

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30|C|11096825||||48393|||||||||||||||||||00120C450

32|||RT|14.01|RTF|13.94|RTT|14.08||||||5|00121E21E

30|C|877098|||AVG|344348||||||R|10|||||||||||||0012202BA

32|||RT|5.04|RTF|4.99|RTT|5.09|||||||001231D26

30|C|2051243|||AVG|455516||||||R|10|||||||||||||001243E74

32|||RT|22.53|RTF|22.43|RTT|22.63|||||||001255B43

3.4 Record Type 20s and 30s for Pesticides (Col 1) -- Florisil Cartridge Check Recovery Values (QC Code 'FLO')

| 20||*FLOP1248A100*|0|FLO||18000|X1201|*1991*|11|14|09|19||||11|||00126852C

21|||||||P1248A1|||||||||2.0||00127993B

30|C|319846||NG||8.695||A|10.000|||||||||S|87.0|||||||00128BFC9

30|C|58899||NG||8.816||A|10.000|||||||||S|88.2|||||||00129E581

30|C|76448||NG||8.690||A|10.000|||||||||S|86.9|||||||001300B3E

30|C|959988||NG||8.891||A|10.000|||||||||S|88.9|||||||0013131F9

30|C|60571||NG||17.498||A|20.000|||||||||S|87.5|||||||001325882

30|C|72208||NG||16.576||A|20.000|||||||||S|82.9|||||||001337EF2

30|C|72548||NG||23.206||A|20.000|||||||||S|116.0|||||||00134A61A

30|C|50293||NG||16.551||A|20.000|||||||||S|82.8|||||||00135CC78

30|C|72435||NG||84.668||A|100.000|||||||||S|84.7|||||||00136F3EA

30|C|877098||NG||9.882||A|10.000|||||||||S|98.8|||||||001371A93

30|C|2051243||NG||20.032||A|20.000|||||||||S|100.2|||||||001384337

| *30|C|95954||NG||2||A|50.000|||||||||S|4|||||||001384338*

3.5 Record Type 20s and 30s for Pesticides (Col 1) -- GPC Recovery Values (QC Code 'GPC')

| 20||*GPC1242A112B*|0|GPC||18000|X1201|*1991*|11|13|09|19||||11|||00139852C

21|||||||G1242A1|||||||||2.0||00140993B

30|C|58899||NG||9.816||A|10.000||||||||||S|98.2|||||||00141E581

30|C|76448||NG||9.690||A|10.000||||||||||S|96.9|||||||001420B3E

30|C|309002||NG||9.891||A|10.000||||||||||S|98.9|||||||0014331F9

30|C|60571||NG||18.498||A|20.000||||||||||S|92.5|||||||001445882

30|C|72208||NG||17.576||A|20.000||||||||||S|87.9|||||||001457EF2

30|C|50293||NG||17.581||A|20.000||||||||||S|87.9|||||||00146CC78

3.6 Record Type 20s and 30s for Pesticides (Col 1) -- Resolution Check Standard (QC Code 'LPC')

| 20||RESC01|0|LPC||18000|X1201|*1992*|04|20|04|44||||9|||001396901

21|||||||RESC01|||||||||2.0||001407BA9

30|C|877098||||||||||R|98.9||||||||||||||0014196FF

32|||RT|5.06||||||||||00142A62C

30|C|5103742||||||||||R|100.0||||||||||||||00143C2DE

32|||RT|11.88||||||||||00144D2EE

30|C|959988||||||||||R|100.0||||||||||||||00145EEFC

32|||RT|12.40||||||||||00146FEF7

30|C|72559||||||||||R|92.3||||||||||||||00147193C

32|||RT|13.10||||||||||00148292B

30|C|60571||||||||||R|100.0||||||||||||||001494422

32|||RT|13.26||||||||||001505422

30|C|1031078|||||||||R|100.0|||||||||||||0015170C8

32|||RT|16.03|||||||||||0015280C6

30|C|72435|||||||||R|98.6|||||||||||||001539B17

32|||RT|17.87|||||||||||00154AB36

30|C|53494705|||||||||R|100.0|||||||||||||00155C8F1

32|||RT|18.15|||||||||||00156D8FE

30|C|2051243|||||||||||||||||||||||00157F0AD

32|||RT|22.53|||||||||||0015800AD

3.7 Record Type 20s and 30s for Pesticides (Col 1) -- Performance Evaluation Mixture (QC Code 'CLE')

| 20||PEM01|0|CLE||18000|X1201|*1992*|04|20|06|26||||12|||001592687

21|||||||PEM01|||||||||2.0||00160389F

30|C|319846||NG||0.020||A|0.020|||R|97.5||||D|0.0|||||||||001615CE1

32|||RT|6.94|||||||||||001626C20

30|C|319857||NG||0.022||A|0.020|||R|94.0||||D|-10.0|||||||||0016391BC

32|||RT|8.25|||||||||||00164A0ED

30|C|58899||NG||0.020||A|0.020|||R|93.4||||D|0.0|||||||||00165C465

32|||RT|8.03|||||||||||00166D388

30|C|72208||NG||0.117||A|0.100|||R|98.5||||D|-17.0|||||||||0017048D9

32|||RT|14.26||||||PB|11.0|13.5|||0017160EC

30|C|50293||NG||0.201||A|0.200|||R|94.6||||D|-0.5|||||||||0017284BB

32|||RT|15.44||||||PB|2.5|13.5|||001739C0C

30|C|72435||NG||0.541||A|0.500|||R|97.4||||D|-8.2|||||||||00174C014

32|||RT|17.86|||||||||||00175D032

30|C|877098||NG||0.038||A|0.040|||R|92.6||||D|5.0|||||||||001806222

32|||RT|5.06||||||||||00181714F

30|C|2051243||NG||0.042||A|0.040|||||||D|-5.0|||||||||0018296ED

32|||RT|22.53||||||||||00183A6ED

3.8 Record Type 20s and 30s for Pesticides (Col 1) -- Initial Calibration Multicomponent Standard (QC Code 'CLS')

| 20||AR166001|0|CLS||18000|X1201|*1992*|04|20|06|58||||12|||00184CFD8

21|||||||AR166001|||||||||2.0||00185E4C3

30|C|12674112||||27928||A|0.200|||||||||||||||||0018606A0

32|||RT|9.00|||||||||1|00187169E

30|C|12674112||||6941||A|0.200|||||||||||||||||001883797

32|||RT|10.80|||||||||2|001894872

30|C|12674112||||6398||A|0.200|||||||||||||||||001906971

32|||RT|11.14|||||||||3|001917A4B

30|C|12674112||||9007||A|0.200|||||||||||||||||001929B36

32|||RT|9.46|||||||||4|00193AB5F

30|C|12674112||||10821||A|0.200|||||||||||||||||00194CD18

32|||RT|7.99|||||||||5|00195DD48

30|C|11096825||||94264||A|0.200|||||||||||||||||00196FF3E

32|||RT|16.86|||||||||1|001971038

30|C|11096825||||74552||A|0.200|||||||||||||||||00198322C

32|||RT|14.23|||||||||2|001994308

30|C|11096825||||32609||A|0.200|||||||||||||||||0020064E5

32|||RT|18.14|||||||||3|0020175D0

30|C|11096825||||34595||A|0.200|||||||||||||||||0020297C7

32|||RT|19.66|||||||||4|00203A8CF

30|C|11096825||||48393||A|0.200|||||||||||||||||00204CABD

32|||RT|14.01|||||||||5|00205DBA2

30|C|877098||||344348||A|0.040|||||||||||||||||00206FCDA

32|||RT|5.05||||||||||002070C06

30|C|2051243||||455516||A|0.040|||||||||||||||||002082DF0

32|||RT|22.54||||||||||002093DFB

3.9 Record Type 20s and 30s for Pesticides (Col 1) -- Initial Calibration Single Component -- Individual Standard A (QC Code 'CLM')

| 20||INDAL13|0|CLM||18000|X1201|*1992*|04|20|11|41||||11|||00304C753

21|||||||INDAL13|||||||||2.0||00305DA70

22|||||||||||||1.0|00306E736

30|C|319846||||867823||A|0.010|||||||||||||||||003070857

32|||RT|6.91||||||||||003081789

30|C|58899||||807087||A|0.010|||||||||||||||||0030937DC

32|||RT|8.01||||||||||0031046FD

30|C|76448||||827300||A|0.010|||||||||||||||||003116728

32|||RT|8.89||||||||||00312766D

30|C|959988||||605148||A|0.010|||||||||||||||||0031397A9

32|||RT|12.38||||||||||00314A7AB

30|C|60571||||638273||A|0.020|||||||||||||||||00315C7CC

32|||RT|13.24||||||||||00316D7CA

30|C|72208||||444069||A|0.020|||||||||||||||||00317F7F3

32|||RT|14.25||||||||||0031807FD

30|C|72548||||444235||A|0.020|||||||||||||||||003192832

32|||RT|14.62||||||||||00320383D

30|C|50293||||401902||A|0.020|||||||||||||||||00321583D

32|||RT|15.43||||||||||003226848

30|C|72435||||174490||A|0.100|||||||||||||||||003238870

32|||RT|17.85||||||||||00324988D

30|C|877098||||373538||A|0.010|||||||||||||||||00325B9B1

32|||RT|5.03||||||||||00326C8D1

30|C|2051243||||496702||A|0.020|||||||||||||||||00327EAA7

32|||RT|22.52||||||||||00328FAA6

3.10 Record Type 20s and 30s for Pesticides (Col 1) -- Initial Calibration Single Component -- Individual Standard Mix B (QC Code 'CLM')

| 20||INDBL15|0|CLM||18000|X1201|*1992*|04|20|12|13||||13|||003292199

21|||||||INDBL15|||||||||2.0||0033034C3

22|||||||||||||1.0|003314189

30|C|319857||||301500||A|0.010|||||||||||||||||003326275

32|||RT|8.25||||||||||0033371A6

30|C|319868||||946215||A|0.010|||||||||||||||||0033492C4

32|||RT|9.27||||||||||00335A1F8

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30|C|7421934||||461669||A|0.020|||||||||||||||||00348EE52

32|||RT|15.69||||||||||00349FE6F

30|C|5103719||||781319||A|0.010|||||||||||||||||00350204E

32|||RT|12.33||||||||||003513041

30|C|5103742||||804407||A|0.010|||||||||||||||||003525220

32|||RT|11.87||||||||||00353622F

30|C|877098||||373538||A|0.010|||||||||||||||||003548353

32|||RT|5.04||||||||||00355927E

30|C|2051243||||496702||A|0.020|||||||||||||||||00356B454

32|||RT|22.53||||||||||00357C454

3.11 Record Type 20s and 30s for Pesticides (Col 1) -- Instrument Blank (QC Code 'LIB')

| 20||PIBLKX1|1|LIB||18000|X1201|*1992*|04|21|12|19||ML|1000|30|||004663C44

21|||||||PIBLKX1|||||||||2.0||004674F64

22|||||||||||10000|1.0||||004686077

| 30|C|319846||UG/L|BDL|||||U|*0.050*|||||||||||||||00469809D

| 30|C|319857||UG/L|BDL|||||U|*0.050*|||||||||||||||00470A0C5

| 30|C|319868||UG/L|BDL|||||U|*0.050*|||||||||||||||00471C0EF

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| 30|C|11096825||UG/L|BDL|||||U|*1.0*|||||||||||||||00496E7D1

| 30|C|877098||UG/L||0.040||*A*|*0.2*|||||||||||||||||||0049708D6

32|||RT|5.06||||||||||004981803

| 30|C|2051243||UG/L|NRP|0.042||*A*|*0.2*|||||||||||||||||||004993E4D

32|||RT|22.54||||||||||005004E58

3.12 Record Type 20s and 30s for Pesticides (Col 1) -- Method Blank (QC Code 'LRB')

```
|       20||PBLK58|1|LRB||18000|X1201|1992|04|21|14|31||ML|1000|30|||0052620A8

|       21||||S|||FPBLK01|1992|04|17||||||2.0||0052739F9

        22||||||||||10000|1.0||||005284B0C

        23|||||||||||||||||||||||P|0|||||||005296F88

|       27||||||||F|1991|11|14|09|19|P1248A1|N|||||||||005308E9E

        30|C|319846||UG/L|BDL|||||U|0.050|||||||||||||||00531AEC2

        30|C|319857||UG/L|BDL|||||U|0.050|||||||||||||||00532CEE8

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        30|C|11096825||UG/L|BDL|||||U|1.0|||||||||||||||00558082B

|       30|C|877098||UG/L||0.19||A|0.2|||||||||S|94|||||||005592E19

        32|||RT|5.06||||||||||005603D46

|       30|C|2051243||UG/L||0.21||A|0.2|||||||||S|100|||||||005616468

        32|||RT|22.53||||||||||005627468
```

3.13 Record Type 20s and 30s for Pesticides (Col 1) -- Matrix Spike Sample (QC Code 'LF1')

```
|       20||X1201MS|1|LF1||18000|X1201|1992|04|21|16|08||ML|300|30|||00563A08B

|       21||||S|||488920|1992|04|17||1992|04|15||2.0||00564BFE5

        22||||||||||5000|1.0||||00565D2D6

|       23|||||||||||||||||MB|1992|04|21|14|31|FPBLK01|P|0|||S|5|R|5|005660949

|       27||||||||F|1991|11|14|09|19|P1248A1|N|||||||||00567285F

|       30|C|319846||UG/L|BDL|||||U|0.050|||||||||||||||005684889
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      30|C|58899||UG/L||0.82||A|1.667|||||P|49||D|12|||||P|12.3|||00571A918

      32|||RT|8.01||||||||||00572B839

      30|C|76448||UG/L||0.69||A|1.667|||||P|41||D|2|||||P|6.2|||00573D7A3

      32|||RT|8.90||||||||||00574E6D6

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      30|C|50293||UG/L||1.5||A|1.667|||||P|90||D|6|||||P|0.0|||005875913

      32|||RT|15.43||||||||||00588691E

|     30|C|72435||UG/L|BDL|||||U|0.50|||||||||||||||00589877C

      30|C|53494705||UG/L|LLS|0.094|J|||||||||||||||P|6.4|||00590AD22

      32|||RT|18.14||||||||||00591BD2E

      30|C|7421934||UG/L|LLS|0.091|J|||||||||||||||P|2.2|||00592E1B6

      32|||RT|15.68||||||||||00593F1D2

|     30|C|5103719||UG/L|BDL|||||U|0.050|||||||||||||||0059412C9

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|     30|C|877098||UG/L||0.20||A|0.20|||||||||S|100|||||||00604598C

      32|||RT|5.03||||||||||0060568AC

|     30|C|2051243||UG/L||0.20||A|0.20|||||||||S|100|||||||006068F0A

      32|||RT|22.52||||||||||006079F09
```

3.14 Record Type 20s and 30s for Pesticides (Col 1) -- Matrix Spike Duplicate Sample (QC Code 'LF2')

```
|     20||X1201MSD|1|LF2||18000|X1201|1992|04|21|16|41||ML|300|30|||00608CBB4

|     21||||S|||488921|1992|04|17||1992|04|15||2.0||00609EB0F
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      22|||||||||||5000|1.0||||00610FE00

|     23|||||||||||||||||MB|1992|04|21|14|31|FPBLK01|P|0|||S|5|R|5|006113473

|     27|||||||||F|1991|11|14|09|19|P1248A1|N|||||||||006125389

|     30|C|319846||UG/L|BDL|||||U|0.050|||||||||||||||0061373B3

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      30|C|76448||UG/L||0.70||A|1.667|||||P||42|D|2|||||P|6.1|||0061802BC

      32|||RT|8.91|||||||||||0061911F0

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      30|C|50293||UG/L||1.6||A|1.667|||||P||96|D|6|||||P|0.0|||006328438

      32|||RT|15.45|||||||||||00633944F

|     30|C|72435||UG/L|BDL|||||U|0.50|||||||||||||||00634B2AD

      30|C|53494705||UG/L|LLS|0.098|J|||||||||||||||P|12.2|||00635D91A

      32|||RT|18.16|||||||||||00636E928

      30|C|7421934||UG/L|LLS|0.096|J|||||||||||||||P|4.3|||006370DCC

      32|||RT|15.70|||||||||||006381DD7

|     30|C|5103719||UG/L|BDL|||||U|0.050|||||||||||||||006393ECE

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|     30|C|877098||UG/L||0.19||A|0.20|||||||||S|97|||||||00649858A

      32|||RT|5.04|||||||||||0065094B5

|     30|C|2051243||UG/L||0.18||A|0.20|||||||||S|91|||||||00651BB13

      32|||RT|22.53|||||||||||00652CB13
```

3.15 Record Type 20s and 30s for Pesticides (Col 1) -- Continuing Performance Check -- Individual Standard Mix A (QC Code 'CLE')

| 20||INDAM72|0|CLE||18000|X1201|*1992*|04|21|22|12||||11|||006882F0F

21|||||||INDAM72|||||||||2.0||00689423C

22|||||||||||||4.0|006904F0F

30|C|319846||NG||0.039||A|0.040|||||||D|2.5|||||||||006917382

32|||RT|6.94||||||||||0069282C1

30|C|58899||NG||0.035||A|0.040|||||||D|12.5|||||||||00693A743

32|||RT|8.03||||||||||00694B666

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30|C|72435||NG||0.438||A|0.400|||||||D|-9.5|||||||||00707132E

32|||RT|17.86||||||||||00708234C

30|C|877098||NG||0.037||A|0.040|||||||D|7.5|||||||||0070947DE

32|||RT|5.05||||||||||00710570A

30|C|2051243||NG||0.061||A|0.080|||||||D|23.8|||||||||007117D18

32|||RT|22.52||||||||||007128D17

3.16 Record Type 20s and 30s for Pesticides (Col 1) -- Continuing Performance Check -- Individual Standard Mix B (QC Code 'CLE')

| 20||INDBM78|0|CLE||18000|X1201|*1992*|04|21|22|51||||13|||00713B40B

21|||||||INDBM78|||||||||2.0||00714C749

22|||||||||||||4.0|00715D41C

30|C|319857||NG||0.036||A|0.040|||||||D|10.0|||||||||00716F95A

32|||RT|8.26||||||||||00717088C

30|C|319868||NG||0.038||A|0.040|||||||D|5.0|||||||||007182D00

32|||RT|9.28||||||||||007193C35

30|C|309002||NG||0.038||A|0.040|||||||D|5.0|||||||||007206076

32|||RT|9.83||||||||||007216FAC

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30|C|5103742||NG||0.038||A|0.040|||||||D|5.0|||||||||007360E68

32|||RT|11.88||||||||||007371E78

30|C|877098||NG||0.042||A|0.040|||||||D|-5.0|||||||||00738436E

32|||RT|5.06||||||||||00739529B

30|C|2051243||NG||0.067||A|0.080|||||||D|16.2|||||||||0074078B5

32|||RT|22.54||||||||||0074188C0

3.17 Record Type 20s and 30s for Pesticides (Col 1) -- Continuing Performance Check -- Performance Evaluation Mixture (QC Code 'CLE')

| 20||PEM90|0|CLE||18000|X1201|*1992*|04|23|13|47||||12|||00777E850

21|||||||PEM90|||||||||2.0||00778FA7A

| 30|C|319846||NG||0.025||A|0.020|||*R*|*99.4*|||||D|-25.0|||||||||007792031

32|||RT|6.93||||||||||007802F65

30|C|319857||NG||0.025||A|0.020|||R|99.4||||D|-25.0|||||||||00781551E

32|||RT|8.25||||||||||00782644F

30|C|58899||NG||0.022||A|0.020|||R|98.7||||D|-10.0|||||||||00783891F

32|||RT|8.03||||||||||007849842

30|C|72208||NG||0.108||A|0.100|||R|98.9||||D|-8.0|||||||||007880CB5

32|||RT|14.27||||||PB|20.0|24.0|||0078924C6

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30|C|50293||NG||0.201||A|0.200|||R|95.9||||D|-0.5|||||||||007904895

32|||RT|15.45||||||PB|4.0|24.0|||007915FE1

30|C|72435||NG||0.518||A|0.500|||R|97.9||||D|-3.6|||||||||0079283EC

32|||RT|17.86||||||||||00793940A

30|C|877098||NG||0.044||A|0.040|||R|98.7||||D|-10.0|||||||||007982735

32|||RT|5.05||||||||||007993661

30|C|2051243||NG||0.041||A|0.040||||||||D|-2.5|||||||||008005C00

32|||RT|22.53||||||||||008016C00
```

3.18 Record Type 20s and 30s for Pesticides (Col 1) -- Field Sample chosen for MS/MSD (QC Code 'LSD')

```
|     20||X1201|1|LSD||18000|X1201|1992|04|23|15|42||ML|400|34|||0080296B4

|     21||||S|||FX1201|1992|04|17||1992|04|15||2.0||00803B55E

      22|||||||||5000|1.0||||00804C84F

|     23||||||||||||||||MB|1992|04|21|14|31|FPBLK01|P|2|||||||00805FBAE

|     27||||||||F|1991|11|14|09|19|P1248A1|N|||||||||008061AC4

|     30|C|319846||UG/L|BDL|||||U|0.050|||||||||||||||008073AEB

|     30|C|319857||UG/L|BDL|||||U|0.050|||||||||||||||008085B14

|     30|C|319868||UG/L|BDL|||||U|0.050|||||||||||||||008097B3F

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      30|C|72559||UG/L|LLS|0.014|JP|||||||||||||||P|27.3|||008165DD3

      32|||RT|13.03||||||||||008176DC4

|     30|C|72208||UG/L|BDL|||||U|0.10|||||||||||||||008188C04

|     30|C|33213659||UG/L|BDL|||||U|0.10|||||||||||||||00819ACEF
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|     30|C|877098||UG/L||0.10||A|0.20|||||||||S|51|||P|0.0|||00846E6CB

      32|||RT|5.04|||||||||||00847F5F6

|     30|C|2051243||UG/L||0.10||A|0.20|||||||||S|53|||P|7.7|||008481C7E

      32|||RT|22.53|||||||||||008492C7E
```

4.0 PESTICIDES (COL. 2)

4.1 Record Type 10 for Pesticides (Col 2)

| 10||||||GC|*OLM04.2P*||TESLAB||||68D00001|INSTP2||TEST LABS INC.||000002A31

4.2 Record Type 11 for Pesticides (Col 2)

11|DB-608||0.53||||||||||||000024AD7

4.3 Record Type 20s and 30s for Pesticides (Col 2) -- Initial Calibration Mean Values (QC Code 'MNC')

20|||0|MNC||18000|X1201|||||||||62|||000036465

30|C|319846|||AVG|1137869||||||R|16|||||||||||||0000485E4

32|||RT|4.56|RTF|4.51|RTT|4.61|||||||00005A047

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30|C|12674112||||35883|||||||||||||||||||||00054566A

32|||RT|5.69|RTF|5.62|RTT|5.76||||||1|0005571C3

30|C|12674112||||16141|||||||||||||||||||||000568ECC

32|||RT|4.70|RTF|4.63|RTT|4.77||||||2|00057AA13

30|C|12674112||||18842|||||||||||||||||||||00058C730

32|||RT|6.51|RTF|6.44|RTT|6.58||||||3|00059E285

30|C|12674112||||15946|||||||||||||||||||||00060FFAE

32|||RT|7.30|RTF|7.23|RTT|7.37||||||4|000611AE0

30|C|12674112||||16309|||||||||||||||||||||0006237EF

32|||RT|8.01|RTF|7.94|RTT|8.08||||||5|00063533C

30|C|11104282||||9686|||||||||||||||||||||000646F7E

32|||RT|3.89|RTF|3.82|RTT|3.96||||||1|000658AB9

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30|C|11104282||||3312|||||||||||||||||||00066A6BF

32|||RT|3.49|RTF|3.42|RTT|3.56||||||2|00067C1EF

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30|C|877098|||AVG|559374||||||R|21|||||||||||||001242054

32|||RT|2.87|RTF|2.82|RTT|2.92|||||||001253A9F

30|C|2051243|||AVG|594715||||||R|16|||||||||||||001265C02

32|||RT|16.34|RTF|16.24|RTT|16.44|||||||0012778FF
```

4.4 Record Type 20s and 30s for Pesticides (Col 2) -- Resolution Check Standard (QC Code 'LPC')

```
|     20||RESC01|0|LPC||18000|X1201|1992|04|20|04|44||||9|||0014186BD

      21|||||||RESC01|||||||||2.0||001429965

      30|C|877098|||||||||R|100.0|||||||||||||00143B560

      32|||RT|2.89||||||||||||00144C495

      30|C|959988|||||||||R|97.0|||||||||||||00145DFEA

      32|||RT|8.71||||||||||||00146EF1C

      30|C|5103742|||||||||R|100.0|||||||||||||001470BCE

      32|||RT|8.89||||||||||||001481B13

      30|C|72559|||||||||R|99.0|||||||||||||001493566

      32|||RT|9.35||||||||||||001504499

      30|C|60571|||||||||R|100.0|||||||||||||001515F90

      32|||RT|9.61||||||||||||001526EC2

      30|C|1031078|||||||||R|96.3|||||||||||||001538AB1

      32|||RT|13.17||||||||||||001549AB1
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30|C|72435|||||||||R|100.0|||||||||||||00155B5AA

32|||RT|13.35|||||||||||00156C5AA

30|C|53494705|||||||||R|100.0|||||||||||||00157E365

32|||RT|14.06|||||||||||00158F36E

30|C|2051243|||||||||||||||||||||||001590B1D

32|||RT|16.35|||||||||||001601B2A

4.5 Record Type 20s and 30s for Pesticides (Col 2) -- Performance Evaluation Mixture (QC Code 'CLE')

| 20||PEM01|0|CLE||18000|X1201|*1992*|04|20|06|26||||12|||001614104

21|||||||PEM01|||||||||2.0||00162531C

30|C|319846||NG||0.021||A|0.020|||R|99.1||||D|-5.0|||||||||0016377E7

32|||RT|4.59|||||||||||001648725

30|C|319857||NG||0.021||A|0.020|||R|94.9||||D|-5.0|||||||||00165ABF2

32|||RT|7.31|||||||||||00166BB15

30|C|58899||NG||0.020||A|0.020|||R|97.8||||D|0.0|||||||||00167DE8D

32|||RT|5.47|||||||||||00168EDC9

30|C|72208||NG||0.103||A|0.100|||R|95.6||||D|-3.0|||||||||0017261EB

32|||RT|10.09||||||PB|11.0|12.0|||0017379E1

30|C|50293||NG||0.182||A|0.200|||R|96.3||||D|9.0|||||||||001749D4D

32|||RT|11.68||||||PB|1.0|12.0|||00175B476

30|C|72435||NG||0.501||A|0.500|||R|94.8||||D|-0.2|||||||||00176D85E

32|||RT|13.34|||||||||||00177E85D

30|C|877098||NG||0.037||A|0.040|||R|95.8||||D|7.5|||||||||001827A3C

32|||RT|2.89|||||||||||001838971

30|C|2051243||NG||0.039||A|0.040||||||||D|2.5|||||||||00184AE9E

32|||RT|16.34||||||||||00185BEAA

4.6 Record Type 20s and 30s for Pesticides (Col 2) -- Initial Calibration Multicomponent Standard (QC Code 'CLS')

| 20||AR122102|0|CLS||18000|X1201|*1992*|04|20|07|31||||7|||002128054

21|||||||AR122102|||||||||2.0||002139525

30|C|11104282||||9686||A|0.400|||||||||||||||||00214B62E

32|||RT|3.89|||||||||1|00215C641

30|C|11104282||||3312||A|0.400|||||||||||||||||00216E70E

32|||RT|3.49|||||||||2|00217F71E

30|C|11104282||||3087||A|0.400|||||||||||||||||002181808

32|||RT|5.67|||||||||3|002192825

30|C|11104282||||2207||A|0.400|||||||||||||||||0022048FE

32|||RT|7.05|||||||||4|002215916

30|C|11104282||||2134||A|0.400|||||||||||||||||0022279EE

32|||RT|8.02|||||||||5|0022389FB

30|C|877098||||559374||A|0.040|||||||||||||||||00224AB44

32|||RT|2.86||||||||||00225BA76

30|C|2051243||||594715||A|0.040|||||||||||||||||00226DC65

32|||RT|16.33||||||||||00227EC66

4.7 Record Type 20s and 30s for Pesticides (Col 2) -- Initial Calibration Single Component -- Individual Standard A (QC Code 'CLM')

| 20||INDAM16|0|CLM||18000|X1201|*1992*|04|20|12|46||||11|||00362366C

21|||||||INDAM16|||||||||2.0||003634997

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22|||||||||||||4.0|00364566A

30|C|319846||||1128992||A|0.040|||R|94.7|||||||||||||003657868

32|||RT|4.56||||||||||0036687A3

30|C|58899||||1040769||A|0.040|||R|96.3|||||||||||||00367A8DC

32|||RT|5.44||||||||||00368B815

30|C|76448||||1070468||A|0.040|||R|96.8|||||||||||||00369D943

32|||RT|5.81||||||||||00370E873

30|C|959988||||834736||A|0.040|||R|95.7|||||||||||||0037109C3

32|||RT|8.68||||||||||003721905

30|C|60571||||842038||A|0.080|||R|95.7|||||||||||||003733932

32|||RT|9.58||||||||||003744874

30|C|72208||||630027||A|0.080|||R|98.1|||||||||||||003756886

32|||RT|10.07||||||||||003767882

30|C|72548||||599176||A|0.080|||R|92.6|||||||||||||0037798E0

32|||RT|11.29||||||||||00378A8E1

30|C|50293||||572605||A|0.080|||R|99.2|||||||||||||00379C90E

32|||RT|11.66||||||||||00380D91A

30|C|72435||||237099||A|0.400|||R|95.5|||||||||||||00381F94A

32|||RT|13.33||||||||||00382093E

30|C|877098||||558724||A|0.040|||R|96.3|||||||||||||003832A85

32|||RT|2.87||||||||||0038439B8

30|C|2051243||||595863||A|0.080|||||||||||||||||003855BB0

32|||RT|16.33||||||||||003866BB1
```

4.8 Record Type 20s and 30s for Pesticides (Col 2) -- Instrument Blank (QC Code 'LIB')

```
|       20||PIBLKB2|1|LIB||18000|X1201|1992|04|21|12|19||ML|1000|30|||004708102

        21|||||||PIBLKB2|||||||||2.0||004719422

        22||||||||||10000|1.0||||00472A535

|       30|C|319846||UG/L|BDL|||||U|0.050|||||||||||||||00473C55B

|       30|C|319857||UG/L|BDL|||||U|0.050|||||||||||||||00474E583

|       30|C|319868||UG/L|BDL|||||U|0.050|||||||||||||||0047505AD

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|       30|C|11097691||UG/L|BDL|||||U|1.0|||||||||||||||004990B8E

|       30|C|11096825||UG/L|BDL|||||U|1.0|||||||||||||||005002C8F

|       30|C|877098||UG/L||0.040||A|0.2|||||||||||||||||||005014D94

        32|||RT|2.89||||||||||005025CC9

|       30|C|2051243||UG/L|NRP|0.011||A|0.2|||||||||||||||||||005038305

        32|||RT|16.35||||||||||005049312
```

4.9 Record Type 20s and 30s for Pesticides (Col 2) -- Method Blank (QC Code 'LRB')

```
|       20||PBLK58|1|LRB||18000|X1201|1992|04|21|14|31||ML|1000|30|||005306672

|       21||||S|||FPBLK01|1992|04|17||||||2.0||005317FC3

        22||||||||||10000|1.0||||0053290D6

        23|||||||||||||||||||||||P|0|||||||00533B552

|       27||||||||F|1991|11|14|09|19|P1248A1|N|||||||||00534D468

        30|C|319846||UG/L|BDL|||||U|0.050|||||||||||||||00535F48C
```

30|C|319857||UG/L|BDL|||||U|0.050|||||||||||||||0053614B2

30|C|319868||UG/L|BDL|||||U|0.050|||||||||||||||0053734DA

30|C|58899||UG/L|BDL|||||U|0.050|||||||||||||||005385434

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30|C|11096825||UG/L|BDL|||||U|1.0|||||||||||||||005624DF5

| 30|C|877098||UG/L||0.18||A|*0.20*|||||||||S|89|||||||0056373E6

32|||RT|2.89||||||||||00564831B

| 30|C|2051243||UG/L||0.21||A|*0.20*|||||||||S|100|||||||00565AA3D

32|||RT|16.35||||||||||00566BA4A

4.10 Record Type 20s and 30s for Pesticides -- Matrix Spike Sample (QC Code 'LF1')

| 20||X1201MS|1|LF1||18000|X1201|*1992*|04|21|16|08||ML|300|30|||00567E66D

| 21||||S|||488920|*1992*|04|17||*1992*|04|15||2.0||0056805C7

22|||||||||5000|1.0||||0056918B8

| 23|||||||||||||||||MB|*1992*|04|21|14|31|FPBLK01|P|0|||S|1|R|1|005704F0F

| 27||||||||F|*1991*|11|14|09|19|P1248A1|N|||||||||005716E25

| 30|C|319846||UG/L|BDL|||||U|*0.050*|||||||||||||||005728E4F

| 30|C|319857||UG/L|BDL|||||U|*0.050*|||||||||||||||00573AE7B

| 30|C|319868||UG/L|BDL|||||U|*0.050*|||||||||||||||00574CEA9

30|C|58899||UG/L||0.73||A|0.833|||||P|88||D|0|||||P|12.3|||00575F7A0

32|||RT|5.43||||||||||0057606CE

30|C|76448||UG/L||0.65||A|0.833|||||P|78||D|1|||||P|6.2|||005772EF6

32|||RT|5.81||||||||||005783E26

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      ......

      ......

      30|C|50293||UG/L||1.5||A|1.667|||||P|90||D|6|||||P|0.0|||00591C120

      32|||RT|11.66||||||||||00592D12C

|     30|C|72435||UG/L|BDL|||||U|0.50|||||||||||||||00593EF8A

      30|C|53494705||UG/L|LLS|0.10|J|||||||||||||||P|6.4|||005941434

      32|||RT|14.03||||||||||005952430

      30|C|7421934||UG/L|LLS|0.089|J|||||||||||||||P|2.2|||0059648C9

      32|||RT|12.34||||||||||0059758C7

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      ......

|     30|C|877098||UG/L||0.19||A|0.20|||||||||S|97|||||||00608C07E

      32|||RT|2.86||||||||||00609CFB0

|     30|C|2051243||UG/L||0.20||A|0.20|||||||||S|100|||||||00610F61C

      32|||RT|16.33||||||||||00611061D
```

4.11 Record Type 20s and 30s for Pesticides -- Matrix Spike Duplicate Sample (QC Code 'LF2')

```
|     20||X1201MSD|1|LF2||18000|X1201|1992|04|21|16|41||ML|300|30|||0061232C8

|     21||||S|||488921|1992|04|17||1992|04|15||2.0||006135223

      22|||||||||5000|1.0||||006146514

|     23|||||||||||||||||MB|1992|04|21|14|31|FPBLK01|P|0|||S|1|R|1|006159B6B

|     27||||||||F|1991|11|14|09|19|P1248A1|N|||||||||00616BA81

|     30|C|319846||UG/L|BDL|||||U|0.050|||||||||||||||00617DAAB

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      ......

      30|C|76448||UG/L||0.66||A|0.833|||||P||79|D|1|||||P|6.1|||006227B5F

      32|||RT|5.82||||||||||006238A90

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      ......

      30|C|50293||UG/L||1.6||A|1.667|||||P||96|D|6|||||P|0.0|||006360D90

      32|||RT|11.67||||||||||006371D9D

|     30|C|72435||UG/L|BDL|||||U|0.50|||||||||||||||006383BFB

      30|C|53494705||UG/L|LLS|0.11|J|||||||||||||||P|12.2|||006396169

      32|||RT|14.05||||||||||006407171

      30|C|7421934||UG/L|LLS|0.092|J|||||||||||||||P|4.3|||006419607

      32|||RT|12.36||||||||||00642A607

|     30|C|5103719||UG/L|BDL|||||U|0.050|||||||||||||||00643C6FE

|     30|C|5103742||UG/L|BDL|||||U|0.050|||||||||||||||00644E7F1

      ......

      ......

|     30|C|877098||UG/L||0.19||A|0.20|||||||||S|96|||||||006530DB9

      32|||RT|2.87||||||||||006541CEC

|     30|C|2051243||UG/L||0.19||A|0.20|||||||||S|94|||||||006554358

      32|||RT|16.35||||||||||006565365
```

4.12 Record Type 20s and 30s for Pesticides (Col 2) -- *72 Hours Aroclor Standard* (QC Code 'CLE')

20||AR122102|0|CLE||18000|X1201|*1992*|07|20|06|23||||7|||002128054

21|||||||VAR1221V2|||||||||2.0||002139525

30|C|11104282||*UG/L*||*200*|||||||||||||||||||||00214B62E

32|||RT|3.89|||||||||1|00215C641

30|C|11104282||*UG/L*||*200*|||||||||||||||||||||00216E70E

32|||RT|3.49|||||||||2|00217F71E

30|C|11104282||*UG/L*||*200*|||||||||||||||||||||002181808

32|||RT|5.67|||||||||3|002192825

30|C|11104282||*UG/L*||*200*|||||||||||||||||||||0022048FE

32|||RT|7.05|||||||||4|002215916

30|C|11104282||*UG/L*||*200*|||||||||||||||||||||0022279EE

32|||RT|8.02|||||||||5|0022389FB

30|C|877098||*UG/L*||*20*||A|0.040|||||||||||||||||00224AB44

32|||RT|2.86||||||||||00225BA76

30|C|2051243||*UG/L*||*20*||A|0.040|||||||||||||||||00226DC65

32|||RT|16.33||||||||||00227EC66

4.13 Record Type 20s and 30s for Pesticides (Col 2) -- Field Sample chosen for MS/MSD (QC Code 'LSD')

20||X1201|1|LSD||18000|X1201|*1992*|04|23|15|42||ML|400|34|||008061655

21||||S|||FX1201|*1992*|04|17||*1992*|04|15||2.0||0080734FF

22|||||||||5000|1.0||||0080847F0

23|||||||||||||||||MB|*1992*|04|21|14|31|FPBLK01|P|2|||||||008097B4F

```
|       27||||||||F|1991|11|14|09|19|P1248A1|N|||||||||008109A65
|       30|C|319846||UG/L|BDL|||||U|0.050|||||||||||||||00811BA8C
|       30|C|319857||UG/L|BDL|||||U|0.050|||||||||||||||00812DAB5
        ......
        ......
|       30|C|60571||UG/L|BDL|||||U|0.10|||||||||||||||00819B90E
        30|C|72559||UG/L|LLS|0.011|JP|||||||||||||||P|27.3|||00820DD67
        32|||RT|9.27||||||||||00821EC9B
|       30|C|72208||UG/L|BDL|||||U|0.10|||||||||||||||008220ADB
|       30|C|33213659||UG/L|BDL|||||U|0.10|||||||||||||||008232BC6
|       30|C|72548||UG/L|BDL|||||U|0.10|||||||||||||||008244A21
        ......
        ......
|       30|C|11096825||UG/L|BDL|||||U|1.0|||||||||||||||008493D1C
|       30|C|877098||UG/L||0.26||A|0.20|||||||||S|130|||||||0085062D8
        32|||RT|2.86||||||||||00851720A
|       30|C|2051243||UG/L||0.28||A|0.20|||||||||S|140|||||||0085298A0
        32|||RT|16.34||||||||||00853A8AC
```

5.0 TYPE 90 -- COMMENTS RECORD

This record could appear anywhere after the Record Type 10. The comment on this record will usually apply to the most previous record type. The example of Record Type 90 below would appear after the Record Type 10 - indicating the software and version number that was used to generate this data.

```
90|CCS SYSTEMS SOFTWARE VERSION 3.5|000023A75
```